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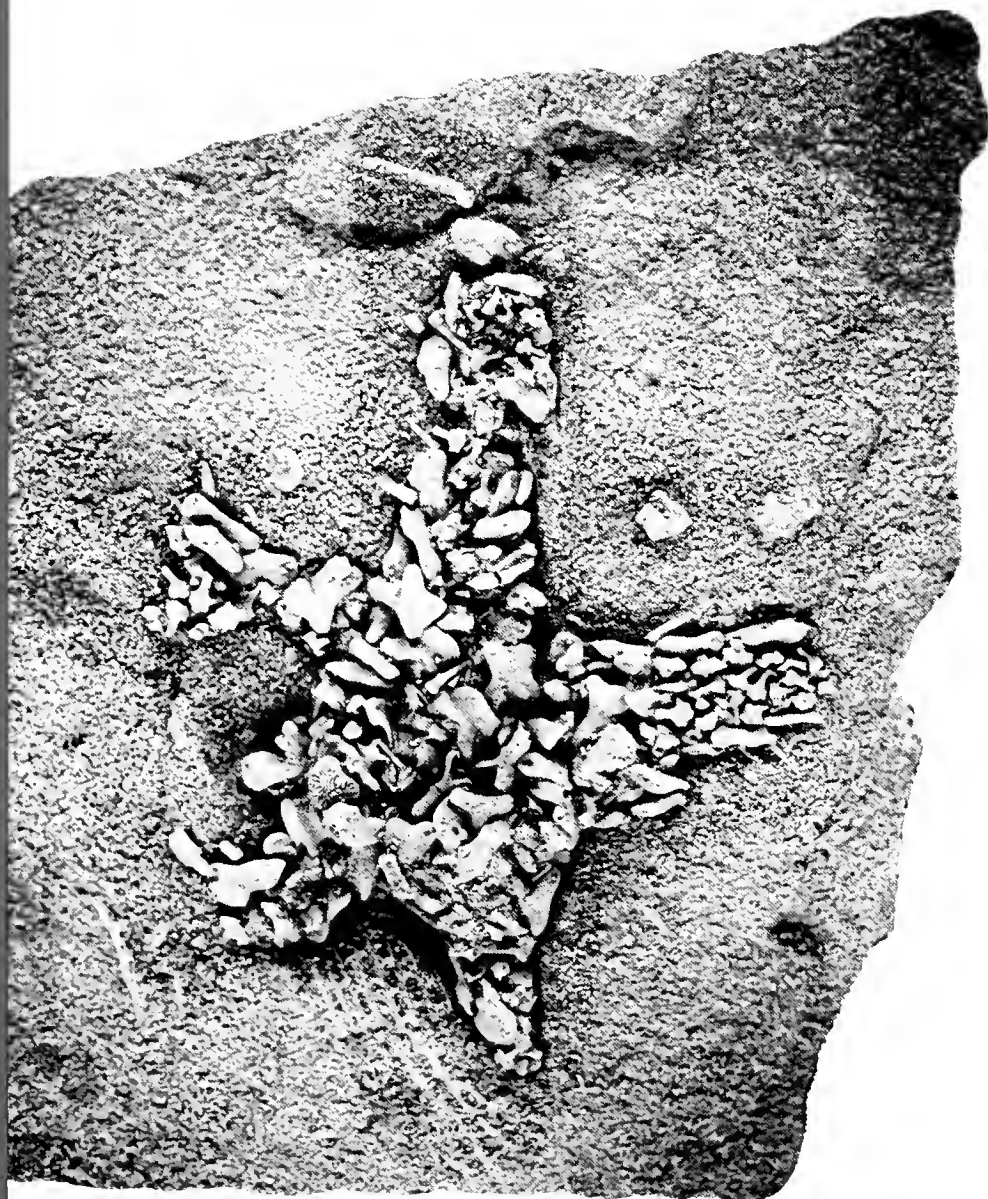
Department of Geology
Alumni Newsletter
Spring 1994

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Cover Photographs: Top view of a Mississippian seastar from southern Indiana. Parts of the arms have been lost, and individual skeletal plates (= "bones") were somewhat rearranged before lithification, but detail is well preserved, revealing aspects of evolution and life mode of the species.

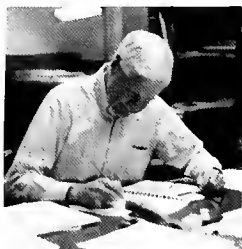
GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in September and February of each year.

Staff: Department Head: W. Hilton Johnson; Asst. to the Head: Peter A. Michalove;
Editor: Vanessa Faurie; Designer: Jessie Knox; Admin. Secretary: Patricia Lane.



Message from the Department Head

W. Hilton Johnson



Dear Alumni and Friends,

Greetings again from the Department! The academic year is rapidly passing, and we are beginning to look toward the end of another successful year. We are meeting the challenges before us, and I think you will be pleased with our efforts. I will summarize some of our accomplishments here, and you can pick up on others in the pages that follow.

Every *GeoSciences* you have received recently has commented on increasing enrollments in our general-education courses. Those trends continue: This year we have 500 more enrollments in those courses than last year, and the enrollment is more than five times the number we were teaching six years ago. Overall, 10 percent of the undergraduate students on campus were in a Geology class this year. Our enrollment record is critical in these times of evaluation and reallocation of funds on campus. But more importantly, we are reaching more students and giving them that insight into the Earth that is so important if we are to be in a better position to face global problems through an informed society.

Concurrent with our enrollment increase has been an increase in external funding. Every year for the past seven, our expenditures from external research grants and contracts have increased, and the total support has more than doubled. This year, 70 percent of the faculty have external support, and more than a third of our graduate students are supported by research assistantships. Both the teaching and research trends become more impressive when considered in light of a faculty size that has decreased more than 20 percent in the same interval. Basically, we are doing more with less.

Your support of the Department also has increased, and again I thank the many alumni and friends who have made contributions through GeoThrust, the Sohl fund and other departmental funds. Your support allows us to do things we otherwise would not be able to do, and I hope more of you will want to join our efforts in making a difference here on campus and in the geosciences.

I was pleased to see many of you at GSA in Boston. We were proud of the number of alumni who received distinguished awards from the various divisions of GSA. I know you will join with me in extending congratulations to them. Please make special note of the announcement in this issue of the Geology Alumni Achievement Award that has been established by the Department. The first award will be made in the fall, so send in your nominations now. If you plan to attend the AAPG meeting in Denver, please remember there will be an alumni reception Monday, June 13, at the Marriott Hotel.

We hope *GeoSciences* keeps you informed of activities here and strengthens your ties with Illinois. Please write and let us know of your activities. If you have suggestions for *GeoSciences* or concerns with respect to the Department, we need to know of them. Not long ago, I received some excellent suggestions from a recent alumnus with respect to our curriculum in environmental geology. Thanks, and do keep in touch.

Sincerely,

A handwritten signature in dark ink, appearing to read "W. Hilton Johnson". The signature is stylized and cursive.

W. Hilton Johnson

Acting Department Head

GeoNews

The Wasatch-Uinta Field Camp in Park City, Utah, offers diversity for U. of I. students.



Department continues its tradition of field study

Field camp—the boot camp for fledgling geologists—is alive and well at the University of Illinois.

After a decline in enrollments in the 1980s that essentially followed the employment trends of the petroleum industry, the Department's own field camp in Sheridan, Wyo., was being run for only a handful of students. One summer there were only three students at the camp, and it was becoming far too costly to continue. So in 1990 the Department decided to start a new

The director of the camp rotates among the five departments, but each sends one or more staff persons every June for the six-week course. Associate Professor Stephen Marshak has gone out in 1990 and '91, and Professor and Head Hilt Johnson, M.S. 61, Ph.D. 62, has gone out in '92 and '93.

Students first do a series of short field exercises that provide an introduction to the area and to geologic mapping. Students learn how to make observations, take notes, record data,



Students gather prior to starting section description and measurement exercise.

chapter in its long tradition of field work.

The U. of I. joined four other major universities in a cooperative known as the Wasatch-Uinta Field Camp in the ski resort/mining town of Park City, Utah. The University of Minnesota-Duluth, the University of Iowa, the University of Wisconsin, Michigan State University and Illinois all have responsibility for the camp, which dates back about 25 years.

make maps and interpret the observations. Then there are four major week-long exercises that emphasize different aspects of the region.

"Compared to our former field camp," Johnson said, "the geology is more diverse. There are things that we didn't have: volcanic geology, igneous intrusions, more complex folding and thrust faulting, contact metamorphism and mineralization. Overall, the students are exposed to more things,

and it's more complex. Our students, therefore, need more background so they usually go out as juniors and seniors."

But whether they are in Sheridan, Wyo., or Park City, Utah, the value of

students and faculty, providing more opportunities to make connections with people from other institutions. For example, after meeting Marshak at the camp, Tim Paulsen decided to do graduate work at Illinois. He also has

participants, with the Department sending five to 10. The camp enjoys strong support from all of its institutions who want to continue to work for improvement. One idea being considered is to introduce a week for an

Charlie Matsch (Minnesota-Duluth) and Hilt Johnson chat in front of Chateau Apres Lodge, prior to departure for the field.



Hilt Johnson directing students during section measuring exercise.



field camp for students remains constant.

"It's when they finally integrate the things they've done back here (at UIUC) in all areas of geology," Johnson said. "It's when they finally really see what geology is all about, space and time relationships and interpretations of past events. It's also an extremely intense period."

Students are usually in the field from 7:30 a.m. to 5 p.m. every weekday, with more evening work of preparing maps and rock descriptions from 7:30 to 10:30 p.m. and longer. Accommodations are in the dormitory lodge of Chateau Apres. It's not a luxury ski resort, but students stay two or three to a room that is furnished with a TV, and there is a swimming pool. The cafeteria and dining hall double as an evening work and study room.

Another of the camp's strengths, Johnson said, is its diversity among



Mark Reagan (labeled as 'lowa') and students in the field, Park City area in the background.

been back to the camp for the last two years as a teaching assistant.

The camp now ranges from 50 to 70

environmental geology project or projects which would replace one of the existing four major projects. It's not a

static program, Johnson said, but it is high-quality. And that's what is important to the Department and will be to alumni when they look back to this point in their geology education.

"By the end of field camp, you're sort of drained," Johnson said. "But for most students, I think it becomes the high point of their undergraduate education. They usually have good memories of the times. They get to meet people from other schools and develop really close friendships. There are a lot of fun times as well as hard work."

Annual Achievement Award established by Department

The University of Illinois Department of Geology has established an annual Geology Alumni Achievement Award, the first of which will be presented in the fall of 1994.

Alumni are invited to submit a letter of nomination explaining the nominee's accomplishments with respect to one or more of the following criteria: 1) a career of outstanding professional achievement; 2) outstanding academic or research achievement; and 3) outstanding service to the University of Illinois Department of Geology.

A committee of faculty and alumni will review the nominations and announce its decision in the fall. A dinner honoring the awardee also will be planned. Nominees who do not receive the award at this time will be considered in future years.

Send nomination letters by May 15, 1994, to the following address:

Patricia Lane
Department of Geology
University of Illinois
1301 W. Green Street
Urbana, IL 61801

One of top seniors in country attends GSA

Geophysics major **Christine Puskas** of Glen Ellyn, Ill., was selected as one of the top 35 seniors from geology departments around the country who attended the 1993 Geological Society of America meeting in Boston.

"It was a lot of fun," she said as she described the activities for the elite group. As well as attending the presentations, there was a reception in the seniors' honor and a field trip

around Boston.

Puskas' studies focus on Brillouin spectroscopy under the tutelage of Associate Professor Jay Bass. She plans to go to graduate school somewhere in the West and work toward a Ph.D.

The trip was sponsored and supported by the GSA and the U. of I. Geology Department. Puskas was chosen for the honor by the Undergraduate study Committee.

Puskas



GSA meeting involves many alums

The names of several alumni cropped up at the Geological Society of America annual meeting in Boston, Mass., last October.

David Stephenson, Ph.D. 65, was elected vice president; and **Sharon Mosher**, B.S. 73, Ph.D. 78, **Mark Cloos**, B.S. 76, **John Cherry**, Ph.D. 66, and **Keros Cartwright**, Ph.D. 73, were named as councilors.

F. Michael Wahl, M.S. 57, Ph.D. 58, was definitely evident as executive director of the Society.

James C. Cobb, B.S. 71, Ph.D. 81, of Lexington, Ky., received the Distinguished Service Award from the Coal Division. **Paul R. Seaber**, Ph.D. 62, of Las Vegas, Nev., and **Stephenson** of Scottsdale, Ariz., each received Distinguished Service Awards from the Hydrogeology Division. And former faculty member **Don U. Deere**, Ph.D. 55 (Engineering), received the Distinguished Practice Award from the Engineering Geology Division.

Faculty and students reap grants, honors

Professor **Tom Anderson** received a grant from the UIUC Research Board for equipment and supplies. The grant is to support research on "Isotopic-Ratio Mass Spectrometry and its Application to Isotopic Variations in Natural Materials."

Associate Professor **Stephen Altaner**, Ph.D. 85, was awarded a grant from the Petroleum Research Fund of the American Chemical Society to study the mechanism of smectite illitization in bentonite, analysis of mixed layer illite/smectite in cretaceous and devonian K-bentonites. He also received an honorable mention certificate as co-author of a paper presented by alumnus **Eric Daniels**, M.S. 89, Ph.D. 92, from the Coal Division of the Geological Society of America at the national meeting in Boston.

Associate Professor **Jay Bass** has received several awards from the National Science Foundation: "Brillouin Scattering Studies of Glasses, Melts and Aqueous Fluids," which includes a supplement to provide research experience for undergraduate students; "Mineral Elasticity by Brillouin Scattering"; and, in collaboration with the University of California-Berkeley, "CSEDI Initiative: Study of Natural Majorite, an Inter-Laboratory Technique Comparison." Bass also has received a grant from the Shared University Research Program for IBM computer equipment.

Graduate student **Amy Berger** was presented the Department's Outstanding Teaching Assistant Award for Fall 1993.

Professor **Wang-Ping Chen** received funding from the National Science Foundation for his project, "A Seismic Study of Subducted Lithosphere."

Professor **Craig Bethke**, Ph.D. 85,

was elected a fellow in the Geological Society of America.

Assistant Professor **Tim Clarke** had three grants come through—one is from the National Science Foundation for the "Missouri to Massachusetts Broad Band Seismometer Deployment"; and two are subcontracts from the Carnegie Institute of Washington. (Carnegie is subcontracting some data analysis work as part of an NSF grant it has.) These are for the "Brazilian Lithosphere Seismic Project" and the "Deep Structure of the Altiplano and Central Andes from Transportable Broad Band Seismic Transect."

Professor **Alberto Nieto** received an equipment grant from the Research Board for his project, "Failure Modes of Asperities in Rock Discontinuities."

Graduate student **Bob Ylagan** received a monetary award from the Graduate College for support of his research and graduate studies during the 1993-94 academic year. The award was in recognition of his receiving an NSF Graduate Fellowship.

Students rate instructors as tops

The following faculty and teaching assistants were listed on the U. of I. students' "Incomplete List of Excellent Teachers on Campus" for the fall 1993 semester. About half of the Department's TAs made the list.

Stephen Altaner, associate professor
Terry Beckman, teaching assistant
Amy Berger, teaching assistant
Ten-hung Chu, teaching assistant
Georg Grathoff, teaching assistant
W. Hilton Johnson, professor and head
Mindy Legg, teaching assistant
Tim Paulsen, teaching assistant
Kelly Rust, teaching assistant
Philip Sandberg, professor
John Werner, teaching assistant
Fred Wright, teaching assistant

CORRECTION

On Page 6 of the Fall 1993 issue of *GeoSciences*, a photo of graduate student Honn Kao was misidentified as Ming Kuo Lee.

The U. of I. Geology Department

ALUMNI RECEPTION AT AAPG

You are invited to attend the
Department's alumni reception
at the June 12-15, 1994, meeting of the
American Association of
Petroleum Geologists in Denver

Monday, June 13
5:30-7:30pm
Marriott City Center

Hope to see you there.

Alumni Profile:

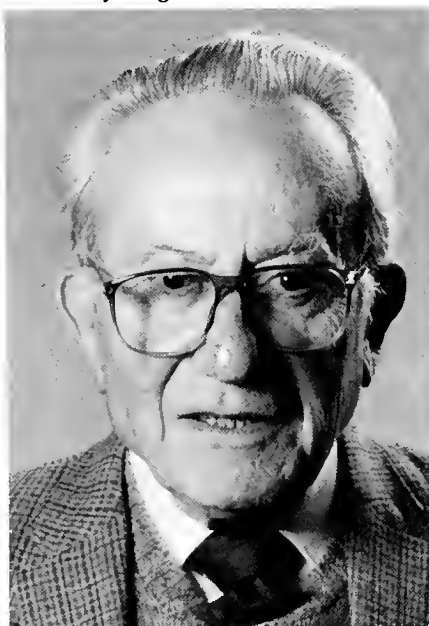
Jack A. Simon

'When I got the job (at the Survey) and started taking geology, I liked it. So I never left it.'



Humility, dignity are his hallmarks

His reputation as a scientist, administrator and gentleman are well-known. He was the heir apparent to the legendary coal geologist (as well as next-door neighbor) Gilbert H. Cady at the Illinois State Geological Survey. And when he rose to the position of chief in 1975, he led the Survey with dignity through some of its most productive yet financially toughest times.



Simon became chief emeritus of the Survey in 1982.

But Jack A. Simon, A.B. 41, M.S. 46, suffered a stroke in 1981 while en route to the annual meeting of the American Institute of Mining, Metallurgical and Petroleum Engineers in Chicago, and his tenure as chief soon came to a premature end. Despite a remarkable rehabilitation where he regained almost all of the 99.9 percent vocal capability he had lost and was named Mercy Hospital's Rehabilitation Patient of the Year, Simon retired with the title of chief emeritus in 1982 and served as principal scientist through 1983.

He hasn't forgotten his professional roots, though. He grew up

with geologists all around him in his Urbana neighborhood, and he began working part-time in the Survey's Coal Section as a senior in high school "doing mostly just kid's stuff." That summer, he was a rodman on a crew surveying drill holes, mines and outcrops in southern Illinois.

When he enrolled at the U. of I., he initially thought he would pursue his interest in history.

"Most people who enter their freshman year at the University of Illinois may think they know what they want, but commonly they don't," Simon said as he recounted his early days while drinking a cup of tea in the dining room of the same house he has lived in since that time. "I was thinking history in high school. When I got the job (at the Survey) and started taking geology, I liked it. So I never left it."

Simon completed his undergraduate degree and was beginning his master's work when he began his World War II service in June 1942. He was commissioned as a second lieutenant in field artillery and was drafted to the tank destroyers but transferred and

World War II veteran Simon.



became a navigator in the Army Air Corps.

After numerous missions over Germany, Simon's whole squadron was shot down Jan. 14, 1945, about 30 miles from Berlin. Simon bailed out and parachuted into a frozen, plowed field. After walking for several hours, he was eventually taken as a prisoner of war. After being moved from camp to camp, Simon recalled his liberation April 29, 1945, in a letter he wrote to his two brothers shortly afterward.

"The morning of April 29 blossomed bright and clear, and the sound of guns was drawing quite near (the camp)," Simon wrote. "The weather was great for flying, and we had a real show put on by the fighters. Some of them buzzed us and then went on to strafe targets beyond. ... At exactly 1215 hours (won't forget the time), there was some excited shouting and running from outside. When I joined the throng, I saw pointing fingers and peering eyes in the direction of the town, which was little more than a mile away. There, big as life and clear as day, on the tallest building in view, was the Stars and Stripes. What a wonderful, thrilling spectacle it was. About 15 minutes later on our front gate, they raised that same wonderful design."

Simon then returned to Urbana to finish the master's work on coal-bearing rock that he had started before the war. He credits Harold Wanless, who happened to live a half-block from the Simon home, as being the teacher who provided him with most of his training. Simon recalled how Wanless went the extra mile to help him when he was completing his thesis in the summer of 1947. Wanless was out in the field, and Simon sent him a rough draft three weeks before the final draft was due, hoping it would be returned in a week or two at best.

"I mailed in on Friday, and it was back on Wednesday," Simon said, still impressed by the memory. "Completely

edited—not slightly edited. It was an excellent job of editing."

Simon spent the next two years at Northwestern for more graduate work and, of all things, a six-week field camp/canoe expedition. His noted diplomacy and gentle humor shown through when he described his reaction to "geology by canoe": "I don't endorse it, and I don't downplay it. If you were a fisherman, it might be more attractive. It was an interesting assignment. I've never done anything like it before or since, so that's all right."

The connection to the Survey was still strong, and in 1953, Simon succeeded retiring mentor Cady as head of the Coal Section. Thus began his rise through the administrative ranks: principal geologist of the Geological Group, assistant chief, acting chief and then chief in 1975.

In recognition of his work and service in coal geology, Simon was awarded the Gilbert H. Cady Award in



Left to right: R. Roley, G. Cady, G. Wilson and Simon worked together in the Survey. Circa 1947.

1975 from the Coal Division of the Geological Society of America. It was a particularly proud honor for Simon but one he modestly maintains he shouldn't have received at the time because "there were many more people who deserved it more, in my view."

During his tenure at the Survey, Simon served on or led numerous state

and federal commissions and committees. "Yeah, there's a long list of them," he said. He helped establish guidelines for environmental regulations and helped determine the direction of coal geology research. He also helped launch a program to examine techniques to remove sulfur from coal long before the idea became popular.

"Jack knew of our work in electron microscopy of solids in our Materials Research Laboratory," wrote Professor Emeritus Charles Wert. "So he encouraged me to see if we could apply those techniques to coal, especially sulfur in coal. We were successful in that attempt, pushing forward sulfur analysis in a way never done before. He encouraged us, prodded and cajoled us. He read out papers (in the beginning our ignorance of coal literature was monumental) and corrected our mistakes. He did this kindly—not scathingly as he might have done. As a result, of the 25 or so papers written by my students, none was rejected and never was the coal-science ever seriously questioned by reviewers. Such errors he had patiently helped us remove long before."

Perhaps his greatest accomplishment was not a singular achievement but what he was able to do throughout his career, that is to maintain the Survey's delicate balance between basic and applied research and to foster cooperation between entities that are more often than not diametrically opposed to one another. Simon has received honorary resolutions from both the Coal Advisory Committee and the Environmental Protection Agency, as a case in point.

"I seen my duty and I done it," he said, half-joking. "I was able to get people together sometimes who might have a little bit of jealousy or whatever."

"There were times when I worked like it was going out of style, seven days a week," he added. "But it was always fun."

Faculty Profile:

Daniel Blake

'(The museum) is a valuable presence on this campus. We have collections of hundreds of thousands of biological specimens that help to document the diversity of life.'



Museum's future is just one of his many concerns

Professor Daniel Blake, B.S. 60, wears several hats in the Department of Geology. Along with the jobs of teacher and researcher, he is the director of the Museum of Natural History—the continued existence of which has been the subject of debate as the University struggles to maintain its programs in light of declining state funding.

No final decision has been made yet, but Blake remains optimistic about the museum's survival.

"I don't think its (closing is) likely at this point," he said. "(The museum) is a valuable presence on this campus. We have collections of hundreds of thousands of biological specimens that help to document the diversity of life. The collection cannot be replaced here or duplicated anywhere else."

The museum has established a computer catalog and a security alarm system. The research collections and public exhibits can accommodate the most sophisticated scholars as well as grade school students. If the museum were to be closed, the collections would not be destroyed, but they would no longer be a part of the University of

Illinois.

"Many other collections have gone to the Smithsonian, for example," Blake said. "But a friend of mine who works with the collections there said, 'We hope you can take care of them because we're having the same problems.' It's not spectacular. But we have a valuable resource here, and we should not let it go."

Aside from his director's role with the museum, Blake also has the duties of teacher and researcher. He returned to the U. of I. in 1967 to teach, which he has always had a high interest in. Being around students and the academic community was more stimulating to him than being in the oil industry—which many other of his fellow paleontologists opted for. Along with the basic paleo courses, he has taught stratigraphy, fossil distribution in rocks, historical geology and some basic physical geology and graduate courses.

"I'm a little old-fashioned in the sense that as a student, I wanted to hear the information," he said. "So what I try to do in my classes is use my experience to provide information that's manage-

The academic environment appealed to Blake more than the private sector.



able and up-to-date. I'm not there to entertain."

Being able to impart the information is important to Blake to achieve personal satisfaction in his teaching. When the Department adjusted to the changing needs of students and cut the introductory paleo course from three lecture hours to two hours a week, Blake struggled to compact all the information he felt he still needed to cover in the shorter time frame. But he realized it just wouldn't work.

"I decided last fall that I simply can't do it all and I'm going to have to block off some of it," he said. "In many ways, that was not a good semester for me because I was still struggling with something I wasn't very satisfied with."

"One reason I'm happy to be doing the historical geology course (this semester) is that it's a good precursor to the paleo course," he added. "Now when I do the paleo course, I know what the students will have had."

But just getting through material or even integrating courses to make them work better is not at the heart of Blake's teaching. His main goal for students is a matter of perspective.

"One of the things about geology that needs to come out in the students' minds is to say, 'Look, this is the way geologists think about these things.'"

For geology students to be successful today, Blake believes a sound foundation of scientific background is essential before specialization. They also need to get out and see rocks and be exposed to a wide variety of science before they can manipulate the ideas behind it.

"Through the years, I've had students who, for one reason or another, take the paleo course before they complete the historical geology course," he said. "It's just a bad idea. They don't do as well. They do not yet have insight into the nature of the significance of geologic time."

"(Geology) is intellectually a wide-

open area in that there are so many different things you can do. In some ways, the Department can cover an extraordinarily broad area of intellectual inquiry. But other than the Earth as a subject, we don't have a whole lot of things in common as a background."

And geology itself has been in a revolutionary transformation with the acceptance of the theory of plate tectonics, changing the way researchers look at and understand the past. The use of computer technology as a tool also has broadened the scope of inquiry.

That is true with Blake's area of interest—the fossils of invertebrates.

"One of the things invertebrate paleontologists always did was to use fossils as guidelines to where the rocks



Blake also splits his time as director of the Museum of Natural History.

are to find oil," he said. "As the years went by, I think more and more people became curious about these biological entities, these signposts. We've seen technological changes, but in some ways there have been shifts in the way people want to look at invertebrates. There is much more interest in the biology of ancient life and what fossils can tell us about evolution and other general topics. A good deal, as it turns out."

Blake became interested in invertebrates when he went out to California in the 1960s to do graduate work. His

thesis at the University of California-Berkeley was on both modern and fossil star fish.

"I kind of drifted into it, I suppose, to an extent," Blake said. "It was more serendipity. I found them to be interesting animals."

He looks at the whole group, from their origins in their early evolution to modern times and how they have changed over time.

"When you hear these programs on dinosaurs and people talking about what they did and how they changed, in a sense, I'm doing the same thing with starfish," he said. "I find the invertebrates interesting because they are peculiar. You can look at a dinosaur and animals of this nature in the vertebrate groups and you can immediately, intuitively understand a little about how they work. But so many of the invertebrates are peculiar, whether it's something like a starfish or a clam, and you wonder how they succeed in these numbers."

Despite a full schedule, Blake's future plans include a return trip to Antarctica through the National Science Foundation at the end of 1994 to study



Blake's area of research interest is invertebrate fossils.

the invertebrates. On top of that, he also will become the new managing editor of the *Journal of Paleontology*.

"It's fun," he said, "and it's going to be something different to do."

Add another hat to the rack.

Student Profile:

Tim Paulsen

'Field camp is where you take all the previous information from all of your courses and stuff you've learned from the classroom and you go out and apply it to real-life situations.'



Leave no rock unturned

Graduate student **Tim Paulsen** first worked with Associate Professor Stephen Marshak out in Utah at the Wasatch-Uinta Field Camp. But Paulsen was doing his undergraduate work through the University of Wisconsin at the time. It was because of that meeting that he decided to come to the U. of I. in the fall of 1991 to work on his master's degree in structural geology.

"I'd always been interested in archeology and geology when I was younger," the Wisconsin native said. "I just happened to wander into a geology class when I was a sophomore at Wisconsin. I had experimented with the liberal arts—anthropology, philosophy, comparative literature—and learned that I really wanted to do those more as hobbies. In geology, I found that I liked it and I liked doing it. I was bitten by the geology bug."

Paulsen took a number of courses,

including the introductory class and the evolution of the earth, but something really clicked when he took petrology and started picking up rocks.

"In fact, the field course was the highlight of my undergraduate education because it's outdoors," he said. "Instead of the stale environment of the classroom, you're out in the mountains taking a course."

The field camp in Park City, Utah, is a cooperative venture of which both Illinois and Wisconsin are a part, along with three other Big Ten universities. Paulsen has since returned there the past two summers as a teaching assistant.

"It was a good experience," he said. "I learned things from both positions (as student and as teacher). I even learned stuff about mapping by teaching other people about mapping. It was good because, as a TA, you're

Tim in Windriver Range, Wyoming.





Tim in Guadalupe Mts.

almost a medium between the professor and the students. By having been a recent student at field camp, you can relate to their problems and exhaustion, which helps with explanations and keeping their motivation up.

"It's a lot of work, but it's probably the most fun you'll ever have doing that much work."

It's not difficult to see that Paulsen is an ardent supporter of the field camp experience.

"Field camp is where you take all the previous information from all of your courses and stuff you've learned from the classroom and you go out and apply it to real-life situations. It's one thing to read about something; but it's another to go out there and actually see what they're talking about."

Paulsen attributes his focus on structural geology to one of his Wisconsin professors and the fact that he finds it "neat" to take a body of rocks and try to figure out their history.

"In structural geology, you're dealing with the three-dimensional

configuration of rock packages. You're trying to figure out the sequence of events of how the rocks actually came to be in their present state," he said and speculated that it might be the historical aspect of the Earth that appeals to his scientific interests.

The main focus of his thesis deals with a mountain belt in Utah. While out at the field camp, a mapping project of part of the Sevier fold-thrust belt revealed some odd relationships. In the area just within the Wasatch Mountains on the south side of the Uinta arch, where Paulsen is working, the Sevier belt takes an unusual east-west trend instead of its normal north-south trend. The goal has been to try and figure out the cause of this curvature and how it evolved.

"It's a weird process," Paulsen said. "When I was initially out there during my first summer, there was this stage where I still had to try and figure out what exactly what would make a contribution to the area. At the end of the second summer, I had ideas about

how I thought things evolved based on the data I had collected. Then Steve came out and basically backed me up, so that was a good feeling. To be stuck out there all summer, camping for a month alone and going crazy, talking to rocks, it was good to have someone come out there and come up with the same interpretation. It was a rewarding experience."

Paulsen likes the way he and Marshak work, calling him "a good idea man."

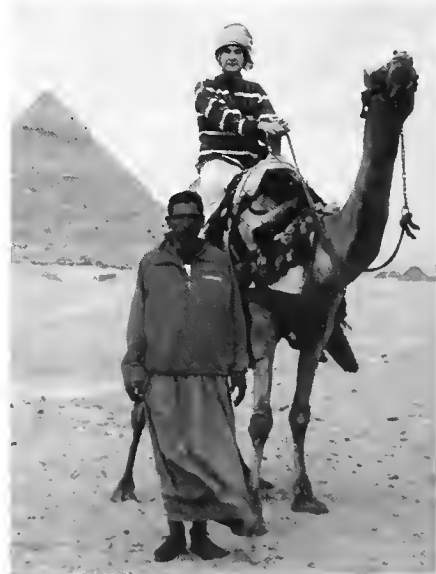
"When you work with Steve," he said, "you do your own thing. He has ideas for you to investigate, but it's pretty much hands-off from there. He's there at the critical times when you need him. It works well for me. I don't think I could have made a better decision by coming to work with Steve."

Since so much of his thesis is field-oriented, Paulsen's approach is essentially to "plop" himself in the middle of his field area and camp for six weeks or so at a time, gathering information.

"It's basically going out there and sticking your nose to a rock and making observations," he said.

He looks for rock that is still intact

Tim riding Moses the camel in Egypt prior to leaving for a geologic expedition along the Red Sea.





Tim in Windriver Range, Wyoming.

and rooted to the crust such as those still in place within a mountain side. From those outcrops, Paulsen estimated that he has sampled about 500 pounds of rocks, many of which sit in boxes under and around his desk in the Natural History Building.

Another aspect of his thesis work involves an extensive cratonic weak zone that runs approximately from South Dakota to South Carolina like a huge scar. "To put it in simple terms," he explained, "it's like the backbone of the United States is essentially broken, and along this weak area there's been repeated movement.

"We read many, many books and papers (pertaining to this part of the mid-continent) and distilled out a number of features that were mentioned in the literature but hadn't been tied together with one coherent idea. It was an incredible learning experience.

"I'm at the stage now where I have to pull it all together," he added. "I

think it's going to be a good thesis."

His days are filled with working on the most pertinent items on his list of things to do, which includes teaching, classwork and research. However, research often takes a back seat to the teaching and classwork, which has included Geology 100, "Geology and the National Parks" and "Structural Geology."

"Oh, I love it," he said. "I think it's great. My first semester here I taught two sections of (Geology) 100 and then taught structure. Structure was the most wonderful experience. When people are interested, it's just great. There's a lot of energy in the classroom.

"But when I went into my 100 discussions, some students were just occupying a chair. It was kind of hard dealing with that. It depressed me after a while. Now what I do is I go in and give fire-and-brimstone lectures. You have to put on a show for those students or you lose them like that. (He



Tim hiking in Windriver Range, Wyoming.

snapped his fingers.) And I've had a good experience lately with 100. I'm happy. It was a challenge, I guess."

For now, Paulsen continues to work on his thesis and is applying to Ph.D. programs. He's not optimistic about the job market right now, but his ideal profession would be to teach at a small liberal arts school while pursuing his research interests. He'd also like it to be in his home state of Wisconsin, close to the Green Bay Packers.

"It's pretty unrealistic," he said and laughed, but then added, "Well, you never know. You never know. ..."

Alumni News

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form you will find at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send a recent photo along, too, but let us know if you want it returned.

The following notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

OBITUARIES

Retired U.S. Air Force Col. **Benjamin Grote**, A.M. 34 (Education), Ph.D. 49, died Jan. 14, 1993, in Albuquerque, N.M. He taught in a rural school in Pike County, Heidelberg College in Ohio and was superintendent of Bluffs School. He was in the Air Force from 1942-48 and from 1951-61 and earned the Legion of Merit. Grote is survived by his wife, Esther, a sister, two nephews and four nieces.

Retired geologist **William W. Hallstein**, B.S. 49, M.S. 52, of Corpus Christi, Texas, died Aug. 6, 1993. He was born in Pekin and worked for the Illinois State Geological Survey before joining Exxon in 1958. Most of his career with Exxon was spent overseas until 1982, when he moved to Texas.

William "Dean" Cunningham, B.S. 57, of Decatur died April 4, 1993. He was 62. He was employed by Minerva Oil Co. as a field geologist prior to joining Illinois Power Co. in 1961. He retired in 1989 as manager of economic development after 29 years with the company. Cunningham was a veteran of the U.S. Marine Corps. He is survived by his wife, mother, son, daughter-in-law, three granddaughters, brother, sister-in-law, nephew, niece, father-in-law and mother-in-law.

Jess Hulsey, M.S. 60, Ph.D. 62, died Sept. 16, 1993, in Houston, Texas. He was retired from Exxon USA.

THIRTIES

Former U. of I. trustee **Park Livingston**, A.B. 30, M.Ed. 81 (Education), was featured in the *Suburban Life*, a newspaper serving Broadview, Hillside and Westchester, Ill. The story documented his many years of service to the University, both during his student years and as a trustee for 24 years. He currently lives in La Grange.

FORTIES

Ed F. Bushman, B.S. 41, and his wife, Louise, were lucky enough to have their Laguna Beach, Calif., home spared by the October wildfires that swept through eight southern California counties. About 18,000 acres east and north of Laguna Beach were burned over, he reported, but most of the town was left unscathed. When residents were ordered to evacuate Oct. 27, the Bushmans went to a friend's vacant apartment in San Juan Capistrano. When they returned several days later, their house was fine, although "ashes were everywhere."

FIFTIES

Just before he retired from the U.S. Geological Survey in May 1992, **Edwin W. Tooker**, Ph.D. 52, received the Department of the Interior's Distinguished Service Award Gold Medal for "exemplary contributions to research on ore deposits and science administration in the Geological Survey."

He and his wife were in New Zealand in October and November and visited with Dr. Maxwell Gage and his wife, Molly Rose, at their home in Napier. "Max was visiting professor from Canterbury University Christ Church in 1952-53 while I was completing my graduate research," Tooker writes. "The Gages are active and stimulating as ever. They send their regards to Geology Department friends."

Donald G. Hauser, B.S. 58, is the project engineer for Sage Consultants Inc. civil and soil engineering firm in Camarillo, Calif. In November 1992, he was elected as director of Division 3 of the Calleguas Municipal Water District.

R. Budiharto, B.S. 59, retired from ARCO in 1984 and is now doing administrative work as general manager for P.T. Digicon Mega Pratama in

Jakarta, Indonesia. He still continues his work as a petroleum explorationist, doing consulting jobs and exploration analyses. He is considering taking full retirement by the end of 1995 or the beginning of 1996.

SIXTIES

David A. Schaefer, A.B. 60, retired in August 1992 as head of formation evaluation for Chevron's Western Exploration Business Unit. He and his wife, Priscilla, A.B. 60 (LAS), live in the shores of Lake Buchanan in the "hill country" of central Texas and have three children and four grandchildren.

Richard E. Smith, M.S. 60, is director of the Technical Assurance Division for Environmental Safety and Health as part of the Department of Energy's Strategic Petroleum Reserve Program. He has spent 32 years in government service, including four years in the military. He also became a grandfather in August 1993.

M.E. Bickford, M.S. 58, Ph.D. 60; **William D. Sevon**, Ph.D. 61; and **Casey M. Diana**, A.B. 91 (LAS), wife of Professor Emeritus Ralph Langenheim, performed Mozart's Requiem in the auditorium of Boston's New England Conservatory of Music as part of the Geological Society of America's 1993 October meeting.

Distinguished Teaching Professor in geosciences at Fredonia State University College in New York **Richard Gilman**, M.S. 59, Ph.D. 61, delivered the commencement address for the Class of 1993. Although he retired in December 1992, he remains on the faculty part time. The structural geologist also created the 1988 *Guide to the Geology of Acadia National Park* in Maine.

John P. Kempton, Ph.D. 62, senior geologist and head of the Quaternary

Framework Studies Section at the Illinois State Geological Survey, retired after 36 years. He now has the honorary title of senior geologist emeritus. Kempton joined the Survey in 1956 as an assistant geologist and was promoted to geologist in 1971. In 1988, he received the Survey's Distinguished Achievement Award. Since 1990, he has been the GSA representative to the Association of American State Geologists.

Robert N. Farvolden, Ph.D. 63, accepted a senior scientific counsel position with the National Groundwater Association. He is a professor and chair of regional hydrogeology in the Earth Sciences Department of the University of Waterloo in Ontario, Canada. He recently received the Distinguished Service Award from the Hydrogeology Division of the GSA.

Gerald Groenewold, B.S. 67, was presented the North Dakota Innovator of the Year award. He is director of the Energy Environmental Research Center at the University of North Dakota in Grand Forks. It is the world's largest low-rank coal research center and the leader in lignite coal and groundwater research.

Stephen C. Ruppel, B.S. 69, is employed by the Bureau of Economic Geology, a research arm of the University of Texas at Austin with a full-time research staff of about 45 geoscientists. His principal research interests continue to be focused on lithological and geochemical characterization of Paleozoic and Cretaceous carbonates in Texas. He is also directing research into the strontium isotope composition of Paleozoic seawater using conodonts.

Richard E. Ely, M.S. 69, is a self-employed consultant after leaving Woodward-Clyde Consultants in March 1993 after 20 years. Lately, his work has

been divided between neotectonic studies of the Colorado Plateau and Sierra Nevada ("the fun part") and contaminant-distribution studies of hazardous waste sites ("pays the bills"). He lives in Sebastopol, Calif.

SEVENTIES

Ron Stieglitz, M.S. 67, Ph.D. 70, is associate dean for graduate studies and research at the University of Wisconsin-Green Bay.

James C. Gamble, M.S. 67, Ph.D. 71, is an engineering geologist in the Geosciences Department of Pacific Gas & Electric Co. in San Francisco, Calif., working from Bakersfield on tunnels, landslides, erosions, earthquake hazards, foundations for gas lines, transmission towers and substations, dams, etc. He writes that he has "enjoyed 12 years of challenges at PG&E with great variety in work and locations and geology."

Retired U.S. Navy Cmdr. **Steve Jamrisko**, B.S. 71, is working for defense contractor SYSCON, Inc., in Arlington, Va.

Harold "Duke" Wilber, B.S. 71, M.S. 73 (LAS), continues summer ranger work at Craters of the Moon National Monument, receiving an NPS certificate of merit with a bonus last summer. He expects to begin teaching geology and physical science at Lincoln Land College in Springfield.

Tom Perkins, B.S. 72, of Occidental Indonesia has been involved in discovering gas (probably more than 2 TCF) at Bintuni Bay, Irian Jaya (the Indonesian part of New Guinea). He's also senior author of a paper describing the field.

Larry Stanker, M.S. 73, Ph.D. 80 (LAS), is project leader and head of the Immunochemistry Research Group for

the USDA's Agricultural Research Service. He recently moved to College Station, Texas, from California, where he was head of the monoclonal antibody facility at the University of California Lawrence Livermore National Laboratory for nine years.

Chris Ledvina, B.S. 74, has founded the National Museum of Coal Mining and is writing a *Pictorial History of Coal Mining in Illinois*. He reports that **Ed Stermer**, B.S. 89, taught in his department at Northeastern University in 1993.

Craig Smith, B.S. 74, is head of the radiogenic isotopes group in the Bernard Price Institute of Geophysical Research at the University of Witwatersrand in South Africa. "Despite the problems, we have maintained research funding," he writes. He and his wife, Meryl, welcomed a second son to the family. Smith is still involved in dating rocks and diamond geology, in addition to a number of other research interests.

Alumni in the Rockies



Polly (Knowlton) Cockett, M.S. 80, of Alberta, Canada; **Pius Weibel**, M.S. 82, Ph.D. 88, from Champaign; **Brian Popp**, M.S. 81, Ph.D. 86; and **Jan Reichelderfer**, M.S. 85, take a hike in the Canadian Rockies. Brian and wife Jan live in Kailua, Hawaii.

Call for '77-'78 field camp reunion

Leah Rogers, M.S. 79, was a field camp student in 1977 and staff member in 1978. She recently called the Department to say she is interested in hearing from students of the '77 and '78 field camps. "Isn't it time for a reunion in Sheridan?" she asks.

Drop her a line and offer your thoughts: 432 Waverley Street, Menlo Park, CA 94025. Her e-mail address is rogers11@llnl.gov. Also send any addresses of other camp students you know, particularly those from other schools.

Rogers continues her work as a hydrogeologist at Lawrence Livermore Laboratory.

EIGHTIES

David Rich, M.S. 77, Ph.D. 80, is employed by Grant Environmental, and Geotech Computer Systems (which he founded in 1986) is combining operations with Grant. Rich is now director of database management serves, and he remains president of Geotech. He writes to say that his cat died, adding, "normally, this would not be big news for an alumni newsletter, except that Rikki spent a good part of his kittenhood dodging darts in our communal office in (the Natural History Building) 18 years ago."

Karen Houck, B.S. 80 (Education), B.S. 80 (LAS), completed her Ph.D. in May 1993 at the University of Colorado on Pennsylvanian rocks near McCoy, Colo.

She is a senior instructor in geology at the University of Colorado-Denver. Last summer, she led a field trip in the McCoy area for the Western Interior Paleontological Society and is organizing an AAPG field trip for June 1994.

Gary Fleeger, M.S. 80, is now a hydrogeologist with the Bureau of Mining and Reclamation in the Pennsylvania Department of Environmental Resources. He reviews the geology and hydrogeology of permit applications for small operators (who produce less than 300,000 tons of coal per year).

Sandra Wyld, B.S. 82, is a research associate and part-time lecturer in the Department of Geology and Geophysics at Rice University in Houston, Texas. She is doing research on regional tectonics and structural geology of the western U.S. Cordillera with her husband, Jim, who is a professor at Rice. They are mostly working in western Nevada and the Klamath Mountains of northern California, with some new work developing in Siberia and Alaska. Wyld has been mostly teaching environmental geology at Rice.

Martha (Hoskins) Schwartz, B.S. 82, is one of two mineralogists at Hasen Research Inc. in Golden, Colo., which conducts minerals processing and hazardous waste treatment research and development. Schwartz does reflected light microscopy, X-ray diffraction, electron microprobe analysis and general lab work. She and husband Robert "Lee," have a daughter, Erin. Lee works in hazardous waste treatment process development.

Karen Fryer, M.S. 82, Ph.D. 86, was promoted to associate professor of geology-geography at Ohio Wesleyan University in Delaware, Ohio. She joined the faculty in 1986.

Dean Rose, B.S. 83, of Champaign is an oil geologist turned custom ironworker. What once was a hobby is now his vocation as Rose creates hand-wrought tables, beds, gates, etc.

Gregory Jarvis, B.S. 85, is a natural resource specialist for the National Park Service and lives in Lakewood, Colo. He has been working on a project and has travelled to Denali and Nome, Ala., Hawaii Volcanos National Park ("where I witnessed the creation of pillow lavas"), Yosemite, Crater Lake and Sequoia national parks. He has been preparing plans and environmental documents (environmental assessment and environmental impact statements). Daughter Kiersten is 4 and son Sean is 1.

Stephen Laubach, M.S. 83, Ph.D. 86, is the co-chair of the upcoming First North American Rock Mechanics Symposium in June at the University of Texas-Austin. Laubach is in the Bureau of Economic Geology at UT.

Paul Mekkelson, B.S. 87, is an intelligence analyst for the Defense Intelligence Agency within the Department of Defense. He assesses raw intelligence data and publishes finished reports. "The attention to detail that I acquired as a student of geology at Illinois has aided me immensely in my career," he writes.

Mekkelson also serves part time as an officer in the Maryland Army National Guard. He received an impact award from the Army last summer while deployed in Germany. He was married in November during a beach-side ceremony in the Virgin Islands.

Mark P. Fischer, B.S. 87, is currently doing postdoctoral research at Penn State University on the brittle and ductile deformation of ice. He defended his Ph.D. dissertation in January and

will graduate in May. In Boston last fall, he collaborated with Terry Engelder and Mike Gross to teach a CSA short course on the fracture mechanics of rock. Mark and his wife, Tamara Webb Fischer, B.S.W. 87, are expecting their second child in March.

Dae-Kyo Cheong, M.S. 88, was named an assistant professor of geology in August at Kangwon National University in the Republic of Korea. He works with **Kyungsik Woo**, Ph.D. 86, who has been at the university since 1986.

NINETIES

Chyi Wang, M.S. 90, lives in Jacksonville, Fla., having moved into a new home in May 1993. He also received permanent-resident status and was planning to return to Taiwan to visit his parents and friends.

Eric Daniels, M.S. 89, Ph.D. 92, received an honorable mention certificate from the Coal Division of the Geological Society of America at the national meeting in Boston. He lives in Irvine, Calif.

Sharon (Horstman) Qi, B.S. 89, M.S. 93, and her husband, Quan, M.S. 90 (Engineering), Ph.D. 92 (Engineering), celebrated the Sept. 23 birth of their daughter, Madeline. Qi also has accepted a position with the USGS in Denver, Colo., where she will be working for the National Water Quality Assessment Program taking care of the ARC-NIFO data base.

Department field trip a success

In fall 1993, 40 students and faculty spent the first Saturday of the semester in the field discussing both regional and local geologic setting. Organized by Associate Professor Steve Altaner and intended primarily for new students, several faculty contributed to discussions of the Precambrian, Paleozoic and Quaternary geology of the mid-continent region. Some of the stops included the Fithian cyclothem, two large Quaternary sections and various nearby sites to discuss the local landscape, coal geology and the origin of saline brines in the subsurface.



Professor Craig Bethke discusses the origin of salt springs along the Salt Fork of the Vermilion River at an I-74 rest stop near Danville. (Or is he really asking for a hand-out with the big salt kettle?) Others facing the camera, from left to right, are graduate student Bill Elinski and faculty members Jim Kirkpatrick, Tim Clarke, Steve Altaner, Richard Hay and Chu-Yung Chen.

Petrology field trip at Villers Caldera, New Mexico, during Spring break 1993.



FRONT ROW: Debbie Vanderlinden, Wendy Gill, Erika Goerich and Don Colby
BACK ROW: Jim Kirkpatrick, Kevin Todhill, Micheal Newman, Tim Lamont and Bruce Miller

Please take a few moments to let us and your class mates know what you've been doing: promotions, publications, election to office, marriages, parenthood, moving, awards. We'd all like to hear from you!

Name_____Response date_____

Home address_____Office Address_____
(indicate if changed)

Home Phone_____Office Phone_____

Degrees from Illinois (with year)_____Degrees from other universities_____

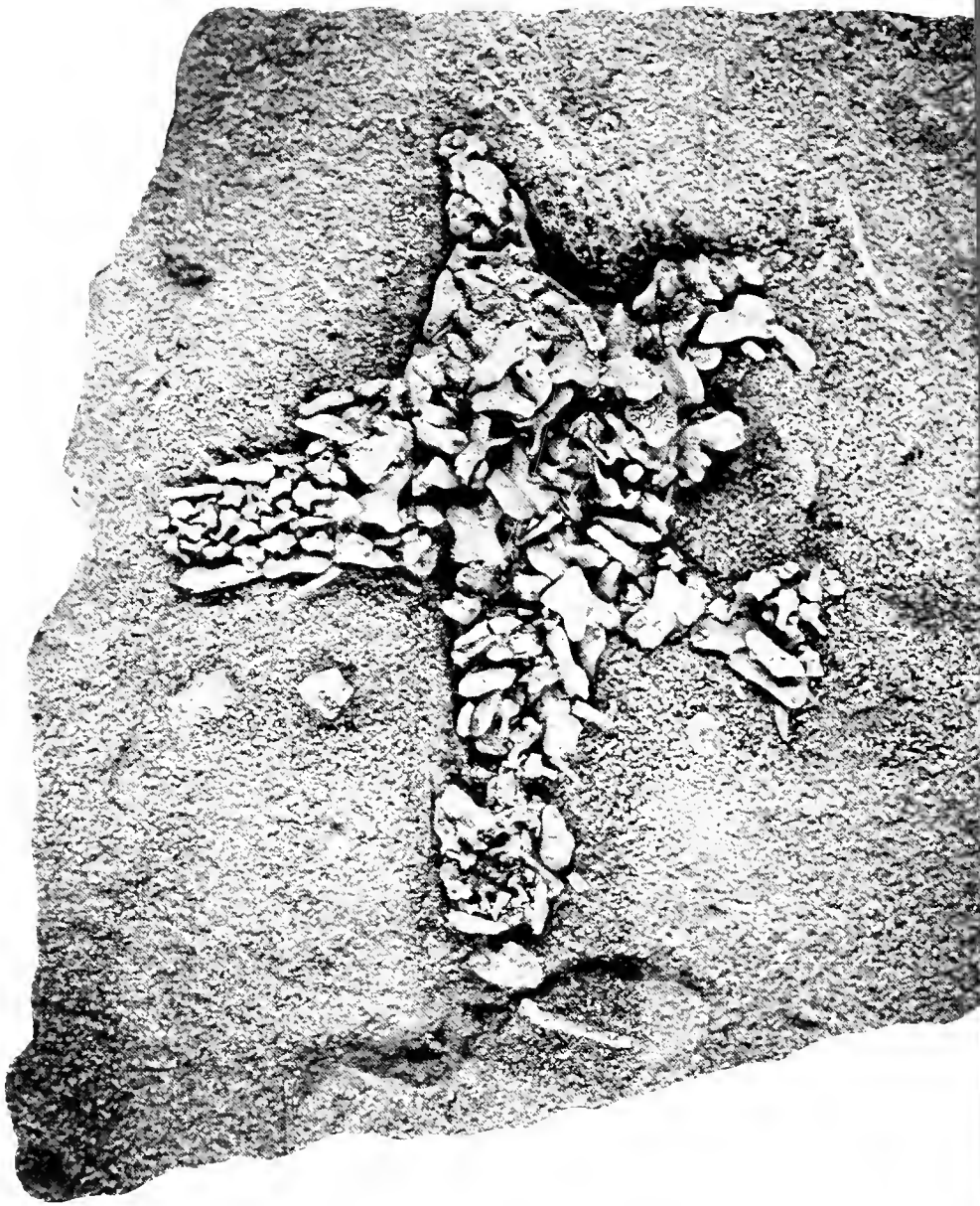
Present employer and brief job description_____

Other news you would like to share_____

Your comments on the alumni newsletter _____

Place
Stamp
Here

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Department of Geology
Alumni Newsletter
Fall '94

Geosciences



UNIVERSITY OF ILLINOIS



GeoSciences

Alumni Newsletter

FALL 1994

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Reply Form

Cover Photos: Beautifully exposed Paleozoic section along the west face of the Arrow Canyon Range, southern Nevada. Strata cropping out along the range front were the focus of several theses under the direction of emeritus professors Dr. R.L. Langenheim and Dr. A.V. Carozzi in the 1960s. More recently, the section has been studied by Ph.D. candidate Fred Siewers to better understand the origin of unconformable surfaces in limestones.

GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in September and February of each year.

Staff: Department Head: R. James Kirkpatrick; Asst. to the Head: Peter A. Michalove; Editor: Vanessa Faurie; Designer: Jessie Knox; Admin. Secretary: Patricia Lane.

Message from the Department Head

R. James Kirkpatrick



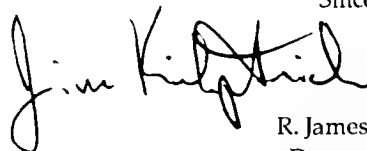
Dear Alumni and Friends,

At the start of this new academic year, I look forward to returning as Head of the Geology Department and accepting the challenges of the future. I especially want to thank Hilt Johnson for his outstanding job as Acting Head this past year; Hilt has worked hard to improve the operation of the Department and to implement our new undergraduate program options. He will continue as Associate Head for the next year and then retire in the summer of 1995. More about that will appear in the spring 1995 newsletter.

I am particularly pleased with our new Geology Alumni Achievement Award and with Jack Simon's selection as its first recipient. Jack has been an outstanding leader for our science and profession and a longtime friend of the Department. There is an article about Jack and the award in this issue of *GeoSciences*, and we hope many of you will be able to attend the dinner in his honor Nov. 18. We will make this award every year and, because the Department has many prominent alumni, we will continue to need your help in selecting new awardees.

One of the University responsibilities I retained during my sabbatical this past year was to chair the Campus Task Force on the Environment. Our charge was to recommend changes in the campus's programs in environmental studies broadly construed. The task force's report is now complete, and preliminary meetings with the campus administration indicate that many of the recommendations of this report are likely to find their way into our programs. I am especially happy with the focus of the report on improving the quality and quantity of undergraduate education in environmental science and with the recognition accorded the Geology Department's rapidly expanding environmental programs. The task force has not recommended a broad, general environmental studies major, but rather greater focus on environmental issues within the context of rigorous departmentally based majors. This is the approach that our Department has taken. The application of geological principles and knowledge to environmental concerns has become a central focus of geology, although not the only one, and the Department will continue to expand its efforts in this direction.

Sincerely,



R. James Kirkpatrick
Department Head

GeoNews

The new award is the result of nominating letters received by a review committee of faculty and alumni.



Simon to receive first Geology Alumni Achievement Award

Jack A. Simon, A.B. 41, M.S. 46, has been named the first recipient of what will be the annual Geology Alumni Achievement Award.

The honor will be presented to Simon on Friday, Nov. 18, 1994, at a special dinner at Jumer's Castle Lodge in Urbana. A reception will begin at 6 p.m., followed by the dinner at 7 p.m. All alumni are invited to attend. To make reservations, send \$25 per person to Pat Lane, Department of Geology, University of Illinois, 1301 W. Green St., Urbana, IL 61801. Make checks payable to the U. of I. Department of Geology. Reservations must be received by Nov. 10.

The new award is the result of nominating letters received by a review committee of faculty and alumni. Any of three criteria can be the basis for selecting a recipient: a career of outstanding professional achievement; outstanding academic or research achievement; or outstanding service to the University of Illinois Department of Geology.

Simon easily satisfies them all. A coal geologist by training, he rose through the ranks of the Illinois State Geological Survey to become chief in 1975. That same year he also received the prestigious Gilbert H. Cady Award from the Coal Division of the Geological Society of America. Simon helped determine the direction of coal geology research and establish guidelines for



Simon

environmental regulations. He has received honorary resolutions from both the Coal Advisory Committee and the Environmental Protection Agency. In 1982 his title changed to chief emeritus at the Survey.

Friends and colleagues are invited to send letters of congratulations and/or reminiscences to the Department for inclusion in a book to be presented to Simon at the November award dinner. Letters should be sent to Pat Lane at the above address by Oct. 24.

Sandberg to retire after fall 1994 semester

After 30 years at the University of Illinois, Professor **Philip Sandberg** will officially retire in December. He has accepted a position at Radford Univer-

sity in Virginia, where he will be involved in developing the curricula for its new College of Global Studies.

The offer was irresistible to



Sandberg because it connects many of his interests—foreign languages, study abroad and computer technology—as well as the opportunity to be instrumental in the establishment of a whole college.

The Louisiana State and University of Stockholm graduate has lived in and traveled to numerous countries throughout his life and speaks several languages. His research work has been just as varied, from ecology to zoogeography to micropaleontology and carbonate sedimentology. In recent

years, he has become more involved in computer-aided learning and has strived to educate larger numbers of people about the sciences.

Arriving at the University as an assistant professor in 1965, Sandberg has committed himself to teaching

general-education geology courses and was an instructor for the U. of I. field courses in the Bahamas during the 1960s and '70s. He was acting Department Head in 1977-78 and was named an associate in the University's Center for Advanced Study.

Faculty garner honors, including top campus teaching award

Associate Professor **Stephen Marshak** and graduate teaching assistant **Timothy Paulsen** were two of 11 recipients of the third annual Harriet and Charles Luckman Undergraduate Distinguished Teaching Awards, the principal campus awards for excellence in undergraduate instruction. The honors were presented April 28 at the annual Instructional Awards Banquet in the Illini Union.



Left to right: Steve Marshak, Sandy Schultz and Timothy Paulsen

The Luckman award is supported by a \$375,000 fund established in April 1991 by the U. of I. alumni for whom it is named. It replaced and improved upon the previous Campus Awards for Excellence in Undergraduate Teaching program. Marshak also received one of four William F. Prokasy Awards for Distinguished Teaching from the College of Liberal Arts and Sciences at its annual awards ceremony April 25 in Assembly Hall. This award is named for the former dean who established it to promote exceptional achievement in undergraduate teaching.

Associate Professor **Jay Bass** was a finalist for the Oakley-Kunde Award for Excellence in Undergraduate Education at the campus level. The award recognizes a faculty member for his involvement with and guidance of undergraduates in research. He received a special certificate from the provost and vice chancellor for his achievements in this area.

Also, in a collaborative project with John Kieffer of the Department of Materials Science, Bass received a National Science Foundation grant for



Bass



Bethke

"Visco Elastic Relaxations in Fragile Glass-Forming Systems."

Professor **Craig Bethke** recently received the Academie des Sciences Professorship for a year of study at a university in France. He plans to spend the year at Ecole des Mines de Paris (Fontainebleau).

Awards dinner honors students

Several students received honors at the annual Geology Awards Dinner last May in the Colonial Room of the Illini Union:



Left to right: Melinda Tidrick, Melinda Legg, MS 94, Amy Berger and Teresa Beckman

Alumni Outstanding Senior Award: Ryan Maulding, Christine Puskas

Estwing Pick Award: Kevin Toohill

Outstanding TA Award (Fall 1993): Tim Paulson

Outstanding Woman Graduate Student Award: Christie Demosthenous

Morris M. & Ada B. Leighton Award: Steven Schimmrich

Norman R. Sohl Graduate Research Award in Paleontology: John Werner

GeoThrust Alumni Fellowship:

Tim Paulson

Harold W. Scott Fellowship:

Terry Beckman

University Fellowship:

Terry Beckman

Also, Eric Holdener, M.S. 91, Junzhe Liu and John Werner all received Graduate College Travel Support Grants to give papers at professional meetings.



From left to right: Robert Ylagen, Christie Demosthenous and Timothy Paulsen

Degrees conferred by the Department of Geology

October 1993

M.S. - Sharon L. Qi

January 1994

B.S. - Bruce P. Miller

Ph.D. - Mary Ann Glennon

May 1994

B.S. - Michael R. Osterhoff, Christine

M. Puskas

Ph.D. - Wanbing Li

August 1994

B.S. - Laura J. Becker, Ryan P.

Maulding

M.S. - Melinda A. Legg, John E.

Werner, Frederick N. Wright

New class offers cross-age learning electronically

Professor Philip Sandberg has developed a new course for college students to interact with grade school students as a way to make all of them more proficient with today's electronic technology as well as to learn more about the sciences.



Sandberg

Project Geo Help, which stands for Geologists-Educators On Line History of Earth and Life Partners, started out in the spring 1994 semester as an optional extra credit project for students in the Geology 143 "History of Life" course. This fall it has been offered as a Freshman Discovery Course, part of the new campus initiative to revamp

undergraduate education that encourages more interaction between undergrads and tenured faculty members. The course is limited to 20 students, primarily freshmen.

The U. of I. students are divided into smaller groups and then assigned a "partner classroom" of primarily grade school students somewhere in the United States. Last semester, classrooms in Oregon, Florida, Virginia, Indiana, Ohio, Pennsylvania, Texas and California, as well as Illinois, participated in the project.

Communicating through electronic mail, the younger students ask questions about science, and the college students then research the topic and provide a detailed reply (after a thorough review and critique by Sandberg). Questions from last semester varied from "How old is the Earth?" to "What is the meaning of life?"

The goals of the course are not only to make people more electronically proficient, but to encourage cross-age learning. Sparked by Sandberg's interest in service education, he wants to reach larger numbers of students. He hopes the project will eventually expand by putting the questions and answers on a wider network to be accessible to all primary and secondary school students.

"We accomplished a lot of objectives," Sandberg said of the project's trial-run, "yet it didn't go as well as I had hoped. But I probably had unduly high expectations."

Although the teachers and grade schoolers were enthusiastic, Sandberg felt there was a lack of interpersonal dialogue. It turned out, the youngsters wanted to know about going to college and the college students themselves as well as about science-oriented issues.

This semester, Sandberg is having his students carry more of the responsibility for the course to encourage more interaction with the grade school students.

Scott honored by Michigan State

Professor Emeritus Harold W. Scott, A.B. 29 (LAS), A.M. 31, was awarded a Bronze Plaque from the Michigan State University geology department for services rendered as chairman of the department from 1969-74.

Scott was part of the U. of I. Department of Geology from 1937-67, and his research interests were in stratigraphy and a number of groups of



Scott

microfossils, primarily ostracoda and conodonts, as well as sponge spicules and foraminifera. He is noted for the discovery of conodont assemblages and also was involved in discovering major petroleum reserves in Libya.

He is the author of *The Sugar Creek Saga: Chronicles of a Petroleum Geologist*, and resides in Urbana with his wife, Joanna, B.Mus. 29.

Ph.D. candidate makes his mark in sedimentology

His background was initially in paleontology, but in the time Fred Siewers has been at the U. of I. working on his Ph.D., he's built a name for himself as a top-notch sedimentology student working with Professor Philip Sandberg.

Last spring, the Department showed its confidence in him and asked him to teach the core sedimentology and stratigraphy course, for which he had been a TA previously.

"I loved it," Siewers said. "The course is a real challenge. It's one thing to teach a lab, it's another to get up in front of 26 students twice a week for hour-and-a-half-long lectures. Illinois students are quite good."

Before he was an Illinois student, Siewers started out doing his undergraduate work at the College of Wooster, a small liberal arts college in Ohio. Originally from North Carolina and raised in Pennsylvania, he chose the college specifically to get a good, broad liberal arts education. One of his first classes was in geology, taught by U. of I. alumnus Fred Cropp, M.S. 56,

Ph.D. 58, and the interest began even though Siewers continued to take a variety of classes. By his junior year, he declared geology as his major with an emphasis on paleontology.

"(People in the geology department) do a lot of things outside, and they're a fun group of people," Siewers said. "They're a close-knit group, and the department had a very good faculty."

Siewers still maintained his other interests, but more as hobbies. The avid blues and jazz fan used to play a lot of guitar and was part of a bluegrass band while in college.

"Geology satisfies a lot of things," he added. "I can be outside doing the field work I like to do. But it also is fairly abstract, so there's an intellectual element. Reconstructing the Earth's history is fairly abstract, and I've just found it to be a very satisfying pursuit."

While working on his master's (which he received in 1988) at Vanderbilt University in Nashville, Tenn., Siewer's adviser suggested he work with limestones in part because the job market for paleo students wasn't very lucrative at the time. The paleontology came in handy, though, for all those fossils found in limestones. During his time in Nashville, he also did some hydrology work at the U.S. Geological Survey Water Resources

Siewers



branch that allowed him to see the "tremendous diversity" of limestones in the Nashville area.

Siewers came to Illinois later in 1988 specifically to study sedimentology of limestones with Philip Sandberg,

the kinds of surfaces in limestones that mark breaks in time. Looking at a cliff of rock as a record of Earth history, for example, there are surfaces in which the record is incomplete.

"Those are referred to as uncon-

develop new criteria for recognizing these surfaces, which are very subtle and often overlooked. He's also had success in finding how discontinuities from particular regions can be correlated over a broad area.

In the 500-700 samples he has been actively working with, the discontinuities are very different. The question became, "Does this represent a time when the limestone was actually exposed to the air and some of it was eroded away, or does this represent a completely submerged surface where the erosion actually took place on the sea floor?"

"I've been able to differentiate between ones that are exposed and ones that aren't better than what had previously been done," Siewers said.

With his thesis almost complete, Siewers is looking for his next step. He said he's interested in working on similar problems in different areas, given that it's all tied into reconstructing Earth's history. Whether it will be a postdoc appointment or a job in industry or something else entirely, the answer is still unknown as of this writing. One possibility is even to return a favor to his wife, Helen, who recently received a master's in landscape architecture. She worked as his field assistant out in the rugged Nevada terrain. Now she is going to the former



Siewers' field research is in an isolated part of Nevada.

who has an international reputation in the field.

"I was immediately impressed when I came here to interview with Philip," he said. "I knew that I needed a mentor, someone with a lot of experience but who would also allow me to do my own thing and work independently. He's treated me like a colleague from Day 1."

Siewers' field research is in central and southern Nevada, where he works on "hardgrounds" (limestone surfaces that became hard within the marine environment) in Middle Ordovician (Whiterockian) limestones.

"They're important for people studying fossil communities because certain kinds of organisms are associated with these hard substrates," he said. "Also, because they turn from sediment to rock quickly, the actual cements that grow between the grains preserve, or have the potential to preserve, the composition of the ocean-atmosphere system. So these surfaces can yield interesting geochemical information."

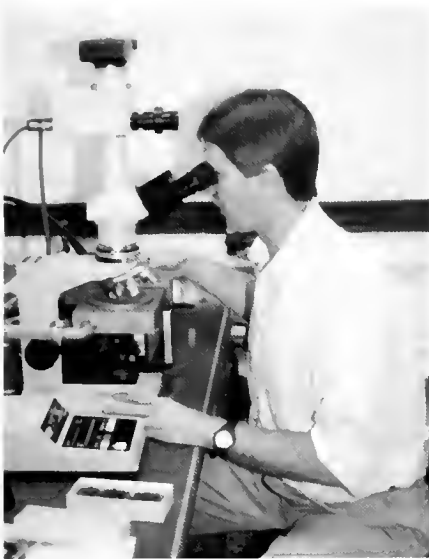
Siewers is specifically zeroing in on

formable surfaces," Siewers said, "or what I've been calling discontinuity surfaces. My thesis really broadened into understanding the origin and the stratigraphic significance of these surfaces—how a surface like that is formed and what it means."

His work has allowed him to

"Siewers likes the fact he can "do (his) own thing and work independently."





Of the 500-700 samples he has been actively working with, Siewers finds the discontinuities to be very different.

East Germany this fall to see how former Eastern Bloc countries are dealing with environmental issues.

"Depending on my job situation, I may go and be her field assistant after wrapping up all these projects," Siewers said. "Ideally, I'd have an academic position and she would be at a landscape architecture firm. We might even like to collaborate on a project some day."



Siewers works with the White Rock series of hardground-type limestones in central and southern Nevada.

Oklahoma alumni meet



Department Head Jim Kirkpatrick met with alumni at a luncheon in Tulsa, Okla., at the Marriott Hotel East last April. From left to right are Karl L. Goodall, A.B. 50; Kirkpatrick, Ph.D. 72; Robert W. Von Rhee, M.S. 77; Allen S. Braumiller, M.S. 57; Richard H. Voris, M.S. 52; John W. Shelton, M.S. 51; and Lester W. Clutter, B.S. 48, M.S. 51.

You're Invited

GSA Alumni Party

in Seattle, Washington

**October 24, 1994
7 p.m. - 9:30 p.m.
Sheraton Hotel
Room 430**

*Cash bar with chips, dips,
pretzels and nuts furnished.*

Alumnus Profile:

Norbert Cygan

"I thought that professors just got up in front of the class, gave their hour talk and left. I didn't know they could be that interested in you."



Alumnus passes along appreciation for education

By John Spizzirri

Norbert Cygan, B.S. 54, M.S. 56, Ph.D. 62, espouses a passion for two things, the outdoors, the sciences and, well, three things, the University of Illinois. Retired now for nearly four years, he worked in many aspects of geology with Chevron for almost 30 years, retiring as director of geologic training and working as a sort of senior consultant for Chevron overseas petroleum.

Born and raised on the southwest side of Chicago, his only exposure to geology was through Boy Scout outings and the pages of National Geographic, whose photographs have inspired many young men and women to travel far afield. But mostly, says Cygan, he got into geology because he always loved the outdoors.

He enrolled at the Chicago Undergraduate Division of the U. of I. at Navy Pier in 1948, where he studied chemical engineering for two years before he was summoned into the Navy. Stationed aboard ship along the Atlantic Coast, Cygan kept up private

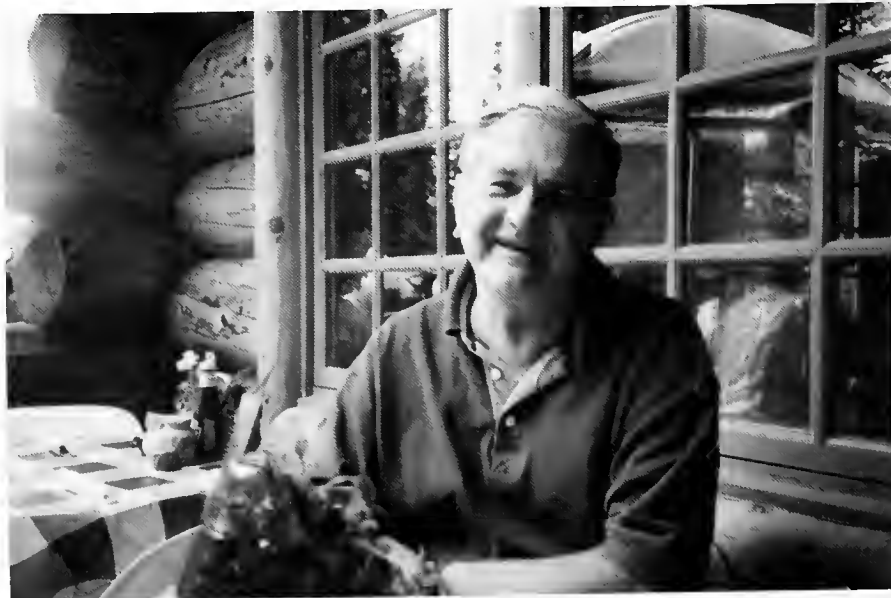
studies of geology and paleontology, discovering that his chemical engineering background was an excellent segue into the field of geology.

Having made officer grade during his short-lived naval career, he traded in his sea legs for the land-locked, rural environs of central Illinois, opting to finish his bachelor's degree at the Urbana campus. During his last two years, Cygan was able to concentrate solely on the geologic studies that, coupled with the obligatory field trips and the company of like-minded students and teachers, clinched his decision to become a geologist.

"The faculty and student friends at the University of Illinois probably made the biggest impact on my life in the 64 years or so I've been kicking around," Cygan emphasized. "They were just a different breed of faculty than what I was used to at a university. These people actually went out on trips and sat around with you in the evening. I thought that professors just got up in front of the class, gave their hour talk and left. I didn't know they could be that interested in you."

This new-found standard of attentiveness motivated Cygan to continue on to graduate school, where he met his future wife, Carol, B.S. 56 (Education). After receiving his master's

Now retired from Chevron, Cygan lives in Englewood, Colo.





Cygan is a director and instructor at Dinosaur Ridge in Colorado.

degree in 1956, he began a three-year teaching stint at Ohio Wesleyan University and married Carol a year later. The couple returned home to Illinois in 1959, and Cygan immediately set to work on finishing the Ph.D. he'd begun at Ohio State, teaching historical geology and spending his summers working with aspiring geologists at the U. of I.'s field camp in Sheridan, Wyo.

Cygan left the University, Ph.D. in hand, in 1962 to begin a long career with Chevron that covered many fields, both scientific and geographic. "I owe the fact that I was able to handle them to the University of Illinois method of education in geology," he said. "One of the things that the head of the department at the time, Professor George White, insisted on was that he was not making specialists, he was creating geologists. And he made sure that you had courses in every sub-field of geology that was available."

Cygan's first job was as a micropaleontologist, scrutinizing the tiny fossils collected from sandstones and mudstones along the Gulf Coast. These fossils help determine the environment of deposition—the circumstances by which these stones were originally deposited and one among a variety of

clues that lead geologists to particular environments which are more likely to contain oil.

"If you're looking for oil being generated, you wouldn't look in a desert environment, you'd look to an environment that has a lot of organic material like a delta. If you're looking for oil being stored, you want a porous, permeable rock like clean sandstone (created from) beaches or sand dunes."

By the early 1970s, the United States was in the middle of an "energy crisis," spurred on by the 1973 Arab oil embargo against the United States, Western Europe and Japan. During the clamor to develop alternative energy resources, Chevron grabbed the bull by the horns and entered the nuclear arena, taking Cygan along for the ride. He had, up until this time, been applying his knowledge of math and statistics to early computer applications in oil and gas geology but soon found himself sleuthing for uranium as part of Chevron's quest for precious minerals.

Cygan hit pay dirt when he discovered a uranium deposit in Panna Maria, Texas, and spent nearly a decade acquiring coal deposits and hunting for gold, silver and copper. When minerals no longer seemed economical, he got

back into oil and gas, working as a consultant for Chevron on international collaborations that would take him to the Sudan, China and Siberia.

His experiences overseas taught him much about other cultures, about how they lived, how they struggled, their work ethics and the intricate strata of foreign science. In China, he found three levels of science operating at the same time. Where the older generation was made up of classically trained geologists, the up-and-coming students were studying American texts and modern geology techniques. Somewhere in between, but far less advanced, were scientists trained during the Cultural Revolution, subjugated to hand-copying pictures from American books.

The oil-rich tiara of Russia had set geologists there on a different course, one that eventually proved a dilemma and exposed Cygan to the harshness of a Siberian winter. Like their Chinese counterparts, the Russian geologists had mastered the specifics of classical geology, but to their detriment, they did not pass along their knowledge.

"Each specialist sort of kept the information to himself and filed it," noted Cygan. "Nobody ever integrated data. But keep in mind, they really didn't have to because all they had to do in the past pretty much was drill a hole. They drilled anywhere and found oil and almost never had a dry hole."

As these readily available resources became depleted, the Russians soon found they lacked the advanced technology to obtain new ones. "They needed to know how to integrate the material and learn new techniques in geophysics and how to drill deeper because their steel and pumps couldn't handle it."

Although he enjoyed the detective aspect of geology, "coming to conclusions from the evidence at hand," Cygan took early retirement in 1990 after nearly three decades in the field. In 1991, his wife, Carol, was diagnosed with leukemia. After a year-long battle with the disease, she died in January 1992, but not before she influenced Cygan's continuing role in science and



Cygan

education, one that gives him just as much satisfaction as did his work with Chevron.

Wherever Cygan's job took them, Carol got a job teaching elementary school science, and he often visited her classes to teach the kids about rocks and fossils. In 1993, Cygan established a scholarship in his wife's name for the teaching of elementary school science and had, by that time, begun working at the national level on earth science education with the American Geological Institute and through grants from the National Science Foundation and various geological organizations.

He now teaches geology to science teachers through the Colorado School of Mines and still carries his box of rocks and fossils with him to schools throughout Colorado, Nebraska and Wyoming, sharing his knowledge of the Earth with students from nursery to graduate school.

"I'm very proud to be a director and instructor of an outfit here in Colorado called Dinosaur Ridge," added Cygan, a resident of Englewood. The ridge serves as a window to prehistory, where kids and adults alike can hunt Jurassic dinosaur bones along one side and follow the paths cut by dinosaur footprints through the

Cretaceous period on the other side.

"The most satisfying thing is working with the elementary school students who've suddenly realized that they can figure things out," he said. "They might look at a rock and figure out that this might be the sand deposited in an old river channel, or we'll find bones and have kids figure out which bone it is. We take a second-grader and we show him a bone that has blades on it. What bone do you have that has blades on it? Well, a shoulder blade. Then we have the kids work out how much bigger it is than their own. I really love it when the kids come up with the answers themselves."

In recognition of his recent work, Cygan received the 1994 Public Service Award from the American Association of Petroleum Geologists. His work in science education also has brought him back to his alma mater, where he has worked with teachers-in-training in the College of Education on how to talk about dinosaurs. He combines his roles as alumnus and geologist by serving on the GeoThrust Committee, which is "trying to raise money so the Department can continue its fine program of research and teaching that it has been known for over the years," he said.

To further alert fellow alumni to

the challenges faced by the Department, Cygan recently hosted a luncheon for 40 Denver-area alums, assisted by Department Head Jim Kirkpatrick and Associate Dean Jim Schroeder.

Cygan has had the distinct honor of practicing Professor White's approach to education throughout the world and to people of all ages, an honor for which he credits the short time spent, geologically speaking, at the University of Illinois.

"I've had a wonderful career," Cygan said. "I was a kid out of Chicago and my father was a blue-collar skilled worker. If it wasn't for the people at the U. of I., I would never have gotten a degree in geology."

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Faculty Profile:

C. John Mann

"Much of geology is still qualitative in nature, that is, descriptive. These areas can be quantified more."



Working out the marriage of math and geology

Given the subjective nature of geology in general, Professor C. John Mann is working to pull the field into more of an objective framework. Gradually, the field does seem to be moving in that direction, but not without a little kicking and screaming along the way.

"There are some areas of geology that are quite well quantified already—geophysics, geochemistry, engineering geology," Mann said. "But much of geology is still qualitative in nature, that is, descriptive. These areas can be quantified more."

Mann's primary interest is in getting mathematical methods into geology, sometimes to the grunts and groans of other geologists.

"That's the reaction one gets often times," he said and laughed. "But the students who come through now are well computerized. It's really a problem in terms of correctly expressing the geological variables in a mathematical sense. That is, using them in ways that are mathematically correct but have

geological meaning to us. It permits us to do things more objectively than the traditional subjectivity of descriptive methods."

For example, Mann is a stratigrapher by training and said stratigraphy is one area that's difficult to quantify because it is largely descriptive. He is doing some work in applying set theory to stratigraphic units to define them in mathematical terms and then to use those terms for further manipulation.

One of the reasons he believes geology is so subjective, and therefore more difficult to quantify, is because it is so much more complex as a whole than, say, physics or chemistry.

That concept is easy to grasp when one enters Mann's long, narrow office in the Natural History Building. The shelves that line the walls on each side of his desk are filled, floor to ceiling, with books and papers and notebooks—the signs of more than 30 years of effort at the University making this marriage of math and geology work.

"The simple relationships aren't always obvious in geology," he said.

It may seem obvious when Mann says one has to have a good background in both math and geology to be a good mathematical geologist. But he really means more than that.

Mann



"You can't be a geologist who does cookbook mathematics. Nor can you be a mathematician who doesn't understand geology. That's too dangerous. You have to know both of them to do it right because it's too easy to make mistakes."

For example, one of his interests is in probability density functions to describe geologic phenomena. He explained how the Gaussian Curve, which is a symmetrical distribution function for measurements of error, is a mathematical concept that just doesn't work in geology.

"Mother Nature does not use the Gaussian Curve," he said. "That's great for error analyses, but I've been trying to find Gaussian distributions in natural geologic data. We can't find them. But once we know the correct probability density function, we know exactly what the natural uncertainty is in our data."

"After many years, I could not see any rhyme or reason to what was going on," he continued. "Now, more recently, I know you can predict what these distributions are if you use the right knowledge about the geology, which I think is interesting."

One way all of this information and mathematical methodology is applied practically is in determining probabilities for nuclear waste storage. As a consultant for the U.S. Nuclear Regulatory Commission, the Nuclear Energy Institute, the U.S. Council for Energy Awareness and Sandia National Laboratories, Mann is actively involved in predicting the safety and uncertainty of estimates for nuclear waste disposal. He also serves on the peer review panel for performance assessment of Sandia's Waste Isolation Pilot Plant, a high-level nuclear waste repository for defense waste and experimental waste from national labs that was designed to demonstrate the safety of this kind of repository.

"How certain are we that by putting the nuclear waste in the ground that it's not going to cause environmental problems 10,000 years (the U.S. standard) from now?" Mann said. "One

has to simply divide it up into as much detail as possible. Some of the things we know about nuclear waste, we can predict fairly accurately. For example, the chemical parameters in terms of leaching of the waste over time. Particularly in the western states, one wonders how much the climate is going to change in 10,000 years. Well, the climatologists just can't tell us. The only thing we have to work with is evidence of climate change from a geological standpoint."

Once the estimates for all the major components, and how well-known the



Mann focuses on making geology more quantified.

values are for those components, are in hand, then the most critical or sensitive parameters can be determined (sensitivity analysis) by changing certain values and seeing how they affect the end result. Sometimes a very small change in a variable can have a significant change in the result.

"When we have all this together, we can identify which of all these parameters is going to be the most critical and those are then looked at in more detail. We attempt to constrain

them, in one way or another, as tightly as possible.

"It may be necessary to go out and collect more data if the uncertainty of our measurements is large. Or there may be some other way to constrain it so it can't fluctuate so much, for example, changing the engineering aspects of it."

A potential commercial waste site in Nevada's Yucca Mountain poses more questions, he said, because it is a much more active tectonic area and has some relatively recent vulcanism nearby. However, it has many advantages, too, because it is a semi-arid area and the repository would be 800 feet above the saturated groundwater level with very little percolation of water downward.

"It's a matter of looking at what's there and coming to an intelligent conclusion," Mann said. "Basically, the geologic environment is pretty safe from a nuclear waste standpoint. Over 10,000 years, the geological environment does not change very rapidly."

Concerned with the future of energy given the limitations of today's more widely used sources, Mann thinks the world will have to look to nuclear energy for the near future, in spite of how people feel about it.

He and Professor Emeritus Ralph Langenheim are currently working on a textbook entitled, *Geology of Energy Resources*, and Mann teaches the "Geology of Energy" undergraduate course in the Department (as well as "History of the Earth").

Even though Mann's research interests revolve around mathematical methods, his courses don't allow for much math to be worked in to any great extent. But that doesn't diminish the value of teaching for him.

"I enjoy it," he said, then laughed. "The students don't always enjoy it. But that's what the University is—it's the teaching. The students are what keep you young, and they're always a challenge."

"The research is rewarding in a professional sense, and the teaching is rewarding in a mental and personal sense."

Student Profile:

Ten-hung Chu

"Nowadays we talk about environmental impact and contamination because we don't really appreciate the Earth and how much it can take."



Geochemist adds a piece of the puzzle to big picture

Graduate student **Ten-hung Chu** began his geologic studies in Taiwan but came to the University of Illinois five years ago to work on his doctorate in geochemistry. The first year was spent talking to professors about their interests and just feeling his way around before beginning work with Professor Tom Anderson.

"Even when I was in high school back in Taiwan, chemistry and biology were my best subjects," Chu said. "In my sophomore year in college, I worked as a lab assistant during the summer. I worked for a professor who was working on stable isotopes in chemistry. So I fell in love with stable isotopes."

Chu's thesis project involves sulfur isotopes from core samples taken from a formation at Leicester, about a three-hour train ride north of London, England. He uses the sulfur isotope as a tool to understand the history of those rocks.

"For each sample of rock, I grind it and separate it into four parts of sulfur," Chu explained. "The whole process takes about six hours. After that, I have to combust those compounds into sulfur dioxide at 900 to 1,000 degrees Celsius. That will take another hour or so."

So far, Chu has done about 60 samples and has collected another 150 more. The samples are from different localities along the formation that spreads from the northeast of England to the southwest. It's organic-rich clay, and people have made it into fuel bricks for years and years.

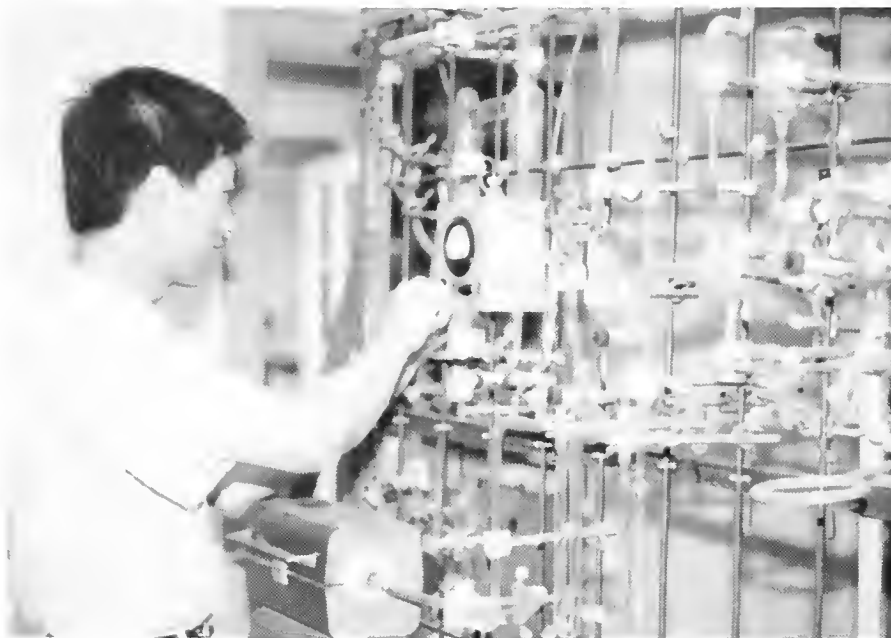
"You can just light it up and it'll start burning," Chu said. "So it has petroleum potential. We want to understand why petroleum formed and why we have petroleum here and not there, and also understand the process of degradation of an organic compound."

Other similar studies have been done before in the California and Florida areas, Chu said, but not to the same extent as this site. And those sites have not had as much organic and stratigraphic background research done on them.

"The most interesting part will be the end of the analysis and data collection," he said. "With data itself,

Chu





Despite his computer interests and Department duties, Chu spends a lot of time in the lab "getting his hands dirty."

there is no meaning. When you put those numbers together with other things, other evidence, other people's research results, you can sort of put together a puzzle and see a story. It's just routine hard work from collection to analysis.

"My research is a small piece of the puzzle; it's going to fit into a bigger picture. I haven't seen the big picture yet because there's still a lot of work to it. But in a way, we can see more and understand more about the Earth, then we can get more out of it. Nowadays we talk about environmental impact and contamination because we don't really appreciate the Earth and how much it can take."

Working with Anderson has been beneficial for him, too. Chu said he has a way of keeping one step ahead all the time. "I'll come in with a lot of questions, and it's like he already knows what I'm going to ask and pulls out a paper and says well this will help solve your problem. He's a very good adviser, and he's also a good person."

Staying on his targeted goal of finishing the thesis by the summer of 1995, Chu plans to analyze another 40 to 50 samples and then begin putting his story together. The worst part of his

work is without question the reading, he said. By reading a lot of references, though, he can find out what other people are looking at in regard to similar problems, how their perspectives differ and why he should think differently.

His summer was spent mostly in the windowless lab in the basement of the Natural History Building, surrounded by glass tubing and vessels, chemicals and a mass spectrometer. Most of his work doesn't involve using computers, which he loves to do, but rather conducting chemical extractions—"the dangerous part," he joked. "We get our hands dirty."

Chu has found a way to indulge in his computer interests, however, as the Department's all-purpose, in-house computer expert and troubleshooter. The computer administrator the Department used to employ was only available for short periods of time, so many people just started informally asking Chu for help and advice. After one semester, the Department officially hired him. During the summer, six new Macintoshes were purchased for the secretarial staff, and Chu did the installation and instruction. He also just likes to play around on the Internet

network, reading about world events, new computer hardware and programming development.

"I have my work station here in the lab so people can send messages to me," he said. "I like the job because I like to have interaction with people and solve problems on-site. If a problem is not urgent, I can schedule it around my work." Then he laughed and continued, "I'm a geologist first and a computer scientist second."

But as much as he enjoys his work in the Department, Chu also feels eager to finish his thesis and move on.

"Five years is enough," he said. "After that, I want to get a job, see if I can find some place to explore more of my interests and see if I can contribute my knowledge to something."

"At this point, I'm looking more into industry because, after so many years in school, you sort of get tired. It's good to stay in school because of the resources and the impact of the people around you. It's very stimulating and gets you thinking. But with an undergrad, master's and doctorate, it'll be more than 10 years in school. So I need some change. I want to see something different."

One major change he's already experienced in his life was the June 24 birth of his first child. So in addition to working, he likes to get home and spend some time with his daughter. But it took some initial adjustment. For the first couple of weeks, he didn't even go into the lab because he wasn't getting any sleep. But now that he's settling into fatherhood, the urge to move ahead is still with him.

"When you stay in a lab for so long, you get isolated," Chu said. "You work on your own thing, your own thesis. But you don't get to interact with people a lot. And personally, I would like to have more impact on human life. My ideal job would be as an on-site consultant. Doing research is great because you explore unknowns. But a lot of times I ask myself, so what's the deal of this for human beings? In the long-term there is something to it, but I sort of want to see it now. I'm impatient."

Alumni News

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form you will find at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send a recent photo along, too, but let us know if you want it returned.

The following notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

OBITUARIES

James S. Cullison, A.B. 28, died May 28, 1994, in Tallahassee, Fla., at the age of 87. Throughout his career, he was a petroleum geologist with Creole Petroleum Corp. (Venezuela), Continental Oil Co. (United States and Egypt), Sahara Petroleum Corp. (Egypt), Oasis Oil Co. (Libya) and Dubai Petroleum Co. (Persian Gulf). He was a member of the Geological Society of America and a fellow since 1945, the American Association of Petroleum Geologists and numerous scientific honorary fraternities. Cullison was also listed in *American Men of Science*.

He was chairman of the geology department at Florida State University from 1950-54 and is survived by his wife, Lorene, a son, a daughter, a brother, eight grandchildren and 15 great-grandchildren.

Almyra Dameier Love, A.B. 29, A.M. 30, died Dec. 4, 1993, in a Fayetteville, Ark., hospital at the age of 99. She was a member of Sigma Xi and Sigma Delta Epsilon and was a part-time instructor in the U. of I. Geology and Botany Departments. She also taught history, reading, math and science at several high schools over the years.

She wrote a weekly nature column for a local newspaper for many years and had a great interest in birds, geology, geography, plant life and astrology. Husband William W. Love preceded her in death.

Carl J. Neer, A.B. 33, died Feb. 23, 1994, at Sarasota (Fla.) Memorial Hospital at the age of 85. He was a member of Theta Delta Chi and was a farm and geology consultant as well as an independent oil producer. He founded and was president of Neer Oil Corp, which operated in Illinois and Indiana.

In 1976 he became semi-retired and moved to Sarasota, Fla. He was a member of the U. of I. Presidents Council since 1967. His wife, Mary J.

Martin, preceded him in death.

He is survived by a sister, a brother, a nephew and a niece.

Thelma Chapman, A.B. 33 (LAS), wife of Emeritus Professor **Carleton Chapman** and one-time Department secretary, died March 28 at the Champaign County Nursing Home after a long illness. She was 86. Along with her husband, survivors include a son, John Chapman, a brother and sister and one grandchild.

After working 12 years as Department secretary, she then worked 12 years for the Geological Survey as a research assistant of chemistry.

Memorial contributions may be made to the Alzheimer's Association East Central Illinois Chapter, Box 962, Champaign, IL 61824.

Eugene H. "Buck" Schroth, M.S. 36, died Dec. 31, 1993, at age 88 at St. Luke's Hospital in Phoenix, Ariz. He was a former biology teacher and coach for Urbana and Monticello schools and was a former high school principal.

He was manager of the U. of I.'s Allerton House for 15 years and volunteered for three years as a nature lecturer and tour guide. Also at the U. of I., he was an announcer for track meets for 31 years and was a sports timekeeper for 28 years.

He is survived by his wife, Maxine, a son, a daughter, a sister and three grandchildren.

Courtland T. Reid, B.S. 40, M.S. 41, of Tybee Island, Ga., died Oct. 25, 1993, at Candler Memorial Hospital in Savannah, Ga., at the age of 83.

He was employed by the National Park Service in park planning until his retirement in 1972. He was also a World War II Army veteran.

His wife, Anna, preceded him in death. Survivors include a daughter, three grandchildren, a brother and a sister.

William A. Hanson, B.S. 51, died Dec. 2, 1992 in Cape Coral, Fla., at the age of 72. He was a World War II veteran in the U.S. Navy and is survived by his wife, Lois, three daughters, a brother and several grandchildren and great-grandchildren.

FACULTY

A special section about the Southern Lake Michigan Coastal Erosion Study that appeared in the *Journal of Great Lakes Research* (Vol. 20, No. 1, 1994) was dedicated to the late **Jack L. Hough**. The collection about the geology of Lake Michigan is the largest to appear in one place. Hough spent much of his life studying the geology and history of the Great Lakes, especially Lake Michigan.

Among his more notable contributions to Great Lakes research were the first bottom-sediment map of Lake Michigan, the first estimate of magnitude of the Chippewa low stage of Lake Michigan and *The Geology of the Great Lakes*—still the most comprehensive collection of information about the Great Lakes. He was in the Geology Department at the U. of I. from 1947-64.

Adjunct faculty member **Keros Cartwright**, Ph.D. 73, principal geologist and head of the Hydrogeology Research Laboratory at the Illinois State Geological Survey, has received a Groundwater Science Award from the Illinois Groundwater Association. The award recognized his outstanding lifetime commitment to research in groundwater science, resulting in significant advances in the protection of groundwater.

Graduate Research Assistants **Junzhe** and **Jianhui Liu** welcomed the birth of their daughter, Melody, on Feb. 10 at 1:47 p.m.

FIFTIES

Paul Regorz, B.S. 53, retired from the California Employment Development Department in 1982. He lives in Oceanside, Calif.

Robert Brownfield, M.S. 55, is retired and currently substituting on the weekends for a Catholic priest who wanted to have some time off. Brownfield also attends classes at the University of Iowa to keep up on stratigraphy and carbonate petrography. He directed research on subsurface of Pennsylvanian in southeast Kansas.

Professor **Paul F. Karrow**, Ph.D. 57, currently has five graduate students working with him in the Department of Earth Sciences at the University of Waterloo, Ontario. He has four children, three of whom are married, and has one grandchild and another one on the way.

His research is in Quaternary history, and he's written several papers on Toronto interglacial and Great Lakes history. He's had sabbaticals in 1970 and 1976-77 in California at Scripps, in 1984 at the University of South Florida in Tampa, and in 1992 at Victoria with the British Columbia Geological Survey. All were chosen, he writes, to allow winter field work.

In May, the University of Waterloo hosted the annual meeting of the Geological Association of Canada. Karrow and **Owen White**, Ph.D. 70, chaired an urban geology symposium, and a subsequent volume of the papers is planned to appear in 1995.

F.L. "Larry" Doyle, Ph.D. 58, currently in San Antonio, Texas, started the environmental consulting firms of HydroGeology Associates and HydroGeology International in June 1993. He writes that his Air Force and industry work keeps him busy. "Giovanna and I are still temporarily stateside, but keep our passports

current for our (we hope) inevitable return to foreign work."

SIXTIES

Paul R. Seaber, Ph.D. 62, received the Award for Distinguished Service in Hydrogeology from the Geological Society of America in October 1993. After a long tenure with the U.S. Geological Survey, he is now senior research scientist and professor of hydrogeology at the Desert Research Institute in Las Vegas, Nev. He is also senior hydrogeologist in DRI's cooperative investigation with World Vision and the Hilton Foundation in exploring for rural water supplies in Ghana.

Robert Farvolden, Ph.D. 63, senior scientist with the National Ground Water Association, was featured on the cover of the December 1993 issue of *Public Works*. Since joining NCWA in 1992, he has developed a new conference for the association, the Forum on Ground Water Remediation, which enables major participants in ground water remediation to meet and address current problems.

His decade-long "Aquifer Study of the Valley of Mexico" is scheduled to be published this year.

Richard E. Coon, Ph.D. 68, is a geotechnical consultant on corporate staff for CH2M Hill, a consulting firm in Bellevue, Wash., with a national and international practice in water supply, wastewater, transportation and environmental engineering. Coon works mainly with water conveyance tunnels, trenchless construction, rock engineering and mine drainage problems.

Last year, he had a consulting assignment in mainland China involving a water supply tunnel for Changchun in the northeastern part of the country. He worked with tunnel designers in the Jilin Province Hydraulic Institute.

SEVENTIES

Chang-Lu Lin, Ph.D. 70, was promoted to assistant to the deputy minister at the Nova Scotia Department of the Environment.

Bill Size, Ph.D. 71, is director of the geosciences program at Emory University in Atlanta, Ga. He attended the 25th anniversary meeting of the International Association for Mathematical Geology in Prague, Czech Republic, in November 1993. He is also associate editor for the GSA Bulletin and Nonrenewable Resources.

James W. Mercer, M.S. 72, Ph.D. 73, is president of the groundwater and environmental consulting firm of GeoTrans, Inc., in Sterling, Va.

At the annual meeting of the American Institute of Hydrology, he was presented the 1994 C.V. Theis Award for making a major contribution in the field of groundwater hydrology. Mercer has spent much of his career working in the area of separate-phase flow, originally in steam-water geothermal systems, now at hazardous waste sites involving nonaqueous phase liquids (NAPLs).

William I. Ausich, B.S. 74, is a professor of geological sciences at The Ohio State University. Along with enjoying his teaching and research, he recently became a co-special publications editor for the Paleontological Society.

Bruce A. Johnson, B.S. 79, has been with Texaco since 1979 and is currently director of quality with Texaco E & P Inc. in New Orleans. He and his wife, Ann, welcomed the birth of their daughter, Julia, in October 1993. She joins her 2-year-old brother Russell.

EIGHTIES

Grant Olson, B.S. 81, is now in large animal veterinary practice at Peninsula Veterinary Service in Sturgeon Bay, Wis., where he performs basically dairy medicine and surgery as well as some horse, sheep, goat and beef work. He's glad to be out of the small animal

setting and back in "the great outdoors in beautiful Door County, Wis."

Alan Woodland, B.S. 81, was recently conducting research in experimental petrology at the Bayerisches Geoinstitut in Bayreuth, Germany, and wife **Sarah Volungis Woodland**, B.S. 81, is working part time for an American environmental consulting firm in Germany on cooperative projects.

After three years in Bayreuth, however, they are moving on. Alan has just started a five-year position at the University of Heidelberg in the mineralogy and petrography department. Sarah is continuing her work from Heidelberg since she is the company's representative in Germany.

The couple do a lot of hiking and visit local breweries, "which is a full-time job in itself in northern Bavaria!" Sarah writes.

Sharon Geil, B.S. 82, manages cleanup of hazardous waste sites at AMC bases across the country as part of the U.S. Air Force at HQ Air Mobility Command. She is primarily responsible for Dover AFB, Del., environmental education for the Command and ensuring the existence of adequate community relations programs Commandwide. The restoration work she began last year of an overused pasture to native prairie is coming along, she reports, and is expected to yield a decent crop of grass this year. She lives in Smithton, Ill.

Paul V. Heinrich, M.S. 82, is a Quaternary geologist and sedimentologist for the Louisiana Geological Survey in Baton Rouge, doing mapping and other research concerning the Pleistocene strata of Louisiana, geologic hazards and environmental concerns.

Jaymee Delaney Soldevilla, B.S. 83, received her M.D. in June from Oregon Health Sciences University. She is now an internal medicine resident at Good Samaritan Hospital for the next three years. She and her husband, Francisco,

have a daughter, Kirstin (6), and a son, Francisco (2 1/2), and live in Portland.

Stephen Laubach, M.S. 83, Ph.D. 86, was the co-chairman of the first North American Rock Mechanics Symposium that was held in June in Austin, Texas.

Jim Klima, B.S. 88, is a geophysicist with Conoco, Inc., in Corpus Christi, Texas, at its Onshore Gulf Coast Division. He is currently exploring for and developing Oligocene Frio and Eocene Yegua oil and gas reserves. His work involves AVO analysis (Amplitude variation with offset), sequence stratigraphy and seismic color attribute analysis.

Klima, his wife, Jan, and their dogs, Hobbes and Blizzard, are still trying to get used to the heat after moving to Texas in 1992.

NINETIES

Richard D. Poskin, B.S. 91, is a graduate assistant in the zoology department at Eastern Illinois University. He recently received a grant from the Philip W. Smith Memorial Fund (along with Edward O. Moll) Illinois Natural History Survey to study the systematics of the False map turtle in Illinois. He also was inducted into the Beta Pi chapter of the Phi Sigma Biological Honor Society.

Steve Hageman, M.S. 88, Ph.D. 92, has a three-year postdoc position in the geology department at the University of Adelaide in South Australia. He is studying the contribution of Modern and Tertiary Bryozoa to cool water carbonate formation. His e-mail address is shageman@geology.adelaide.edu.au.

Mary Ann Glennon, Ph.D. 94, and husband Dan Van Roosendaal, M.S. 91 (civil eng.), welcomed the birth of their son, John William on March 8, 1994. The family lives in Woodridge.

Please take a few moments to let us and your class mates know what you've been doing: promotions, publications, election to office, marriages, parenthood, moving, awards. We'd all like to hear from you!

Name _____ Response date _____

Home address _____ Office Address _____
(indicate if changed)

Home Phone _____ Office Phone _____

Degrees from Illinois (with year) _____ Degrees from other universities _____

E-mail address _____

Present employer and brief job description _____

Other news you would like to share _____

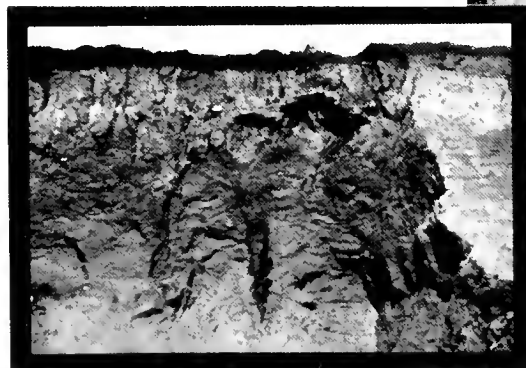
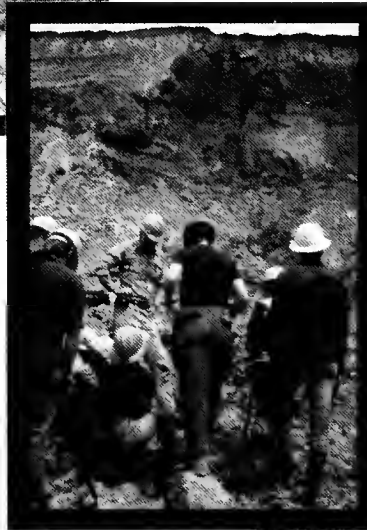
Your comments on the alumni newsletter _____

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Department of Geology
Alumni Newsletter
Spring '95

Geosciences



UNIVERSITY OF ILLINOIS



GeoSciences

Alumni Newsletter

S P R I N G 1995

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in September and February of each year.

Staff: Department Head: R. James Kirkpatrick; Asst. to the Head: Peter A. Michalove; Editor: Vanessa Faurie; Designer: Jessie Knox; Admin. Secretary: Patricia Lane.

Message from the Department Head

R. James Kirkpatrick



Dear fellow alumni,

As is usually the case in the Department, there is much going on and much to report to you.

I have just returned from Houston, where I met with a group of very committed Illinois Geology alumni organized by Jack Threet and Tricia Santogrossi. This group is in the process of raising an endowment to support a graduate fellowship in the Department. So far, the campaign has gone very well. If you live in the Texas/Louisiana area, you may have already heard from someone in the group by the time you receive this publication.

As part of the University-wide Campaign Illinois, the GeoThrust Committee is hoping to establish similar groups of Geology alumni in other parts of the country to help provide endowments for other objectives, such as scholarships, an undergraduate student research fund and a library book fund. You will hear more about these later.

As described more in an article in this issue, Hilt Johnson is retiring at the end of this academic year. The Department will miss his wisdom and humanity very much. Hilt has been Associate Head for the past few years, and I will miss his advice and extraordinary organization of our educational program. He has played a major role in our success in the past few years.

Another story in this issue tells of Philip Sandberg's retirement from the University. Philip has taken a position in the new College of International Studies at Radford University, Virginia, where he will be teaching some geology courses and working to establish the new international programs of that college. Philip has made major contributions to our teaching success, and much of the remarkable increase in enrollments that we have seen in the past several years has been thanks to his enthusiasm and talent for teaching.

We expect to be able to replace both Philip and Hilt over the next two to three years. We have not yet decided in what disciplines the new faculty will be working.

Enrollment continues to increase, with this semester's total enrollment up about 20 percent from last semester. Employment for our majors and graduate students remains reasonably strong.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jim Kirkpatrick". The signature is fluid and cursive, with the first name "Jim" written in a larger, more prominent script than the last name.

R. James Kirkpatrick
Department Head

GeoNews

The Department honors Simon with its first Alumni Achievement Award.



Alumni Achievement Award dinner lauds Simon

Chief Emeritus of the Illinois State Geological Survey Jack A. Simon, A.B. 41, M.S. 46, received the first Geology Alumni Achievement Award at a Nov. 18 reception and dinner in Urbana.

Longtime friend and fellow coal geologist Hal Gluskoter served as master of ceremonies.

The award, which will be presented annually, recognizes outstanding professional, academic or research achievement or outstanding service to the Department of Geology by an alumnus. A review committee of faculty and alumni select the recipient based on nominating letters.

Below: Simon accepts the award from GeoThrust Chair Haydn Murray, right

Top Right: Simon
Center Right: Department Head Jim Kirkpatrick, left, and Simon

Bottom: Colleagues, friends, alumni celebrate the first presentation of the annual Geology Alumni Achievement Award.



Department bids farewell to Sandberg

It was a fond farewell Dec. 9 when those in the Geology Department feted Professor **Philip Sandberg** upon his retirement after 30 years at the University of Illinois. The celebration took place at the House of Hunan restaurant in Champaign.

Sandberg is now involved in developing the curricula for the new College of International Studies at Radford University in Virginia.

Top Left: Sandberg and his wife, Susan Brown-Sandberg.

Bottom Left: Sandberg opening gifts.

Top Right: Department Head Jim Kirkpatrick, right, presents a plaque to Sandberg.

Center Right: Friends and colleagues gather at an area restaurant to say goodbye.

Bottom Right: Sandberg received several departing gifts with the assistance of his doctoral student Fred Siewers, right.



New scholarships available for field camp

Five thousand dollars in scholarships from the GeoThrust Committee will be made available to undergraduate students in the Department for the Wasatch-Unita Geology Field Camp in Park City, Utah.

The Undergraduate Study Committee will award the scholarships this spring based on a combination of need and merit.

Faculty members, students receive grants and awards

Professor **Dan Blake** received a National Science Foundation grant from its Office of Polar Programs for the study of the paleogeological setting of eocene echinoderms at Seymour Island in the Antarctic Peninsula.



Professor **Wang-Ping Chen** received a National Science Foundation grant for "Waveform Analysis of Short-Period and Broad-Band Seismic Data for Upper Mantle Structure Along the Northwestern Pacific." It is a collaborative project with Purdue University.



Elizabeth Paredes was a recipient of the American Geological Institute's Minority Geoscience Scholarship (AGI-MPP) for the 1994-95 academic



year. Students so honored are minority geoscience majors who have a particular potential for success in the geoscience profession.



Teaching Assistant **John Werner** received the Departmental Teaching Award for the spring 1994 semester.



Alumnus Profile:

Lester Clutter

'I've just been a lucky son
of a gun all my life, I guess.'



Giving something back for his world of Experience

By John Spizzirri

World War II and American involvement in North Africa escalates. Airmen stationed at Dale-Mabry Field in Tallahassee, Fla., are given the option to join those forces or enroll in Army Specialized Training programs. Aerial photographer **Lester Clutter**, B.S. 48, M.S. 51, opts for the additional schooling and is assigned to the University of Illinois at Urbana-Champaign.

"It was all fun and games in a way because we were stationed in fraternity houses which had been turned over to the Army," says Clutter. "I might also add that from my viewpoint it was a disaster."

Well, not a total disaster. Despite the university's lack of preparedness to meet the educational needs of the soldiers — five books shared among classes upwards of 60 students — Clutter did meet a "beautiful redhead" named Ginger. After a semester and a half, he and two-thirds of his classmates dropped out and returned to regular military duties. But it was not the last he would see of UIUC, or of Ginger.

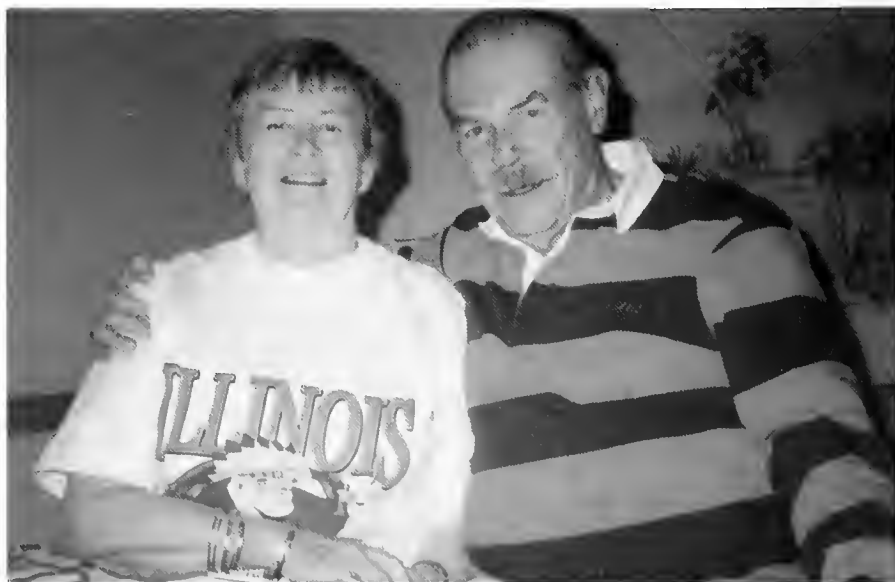
Clutter eventually flew 31 B-17 missions over Germany and Northern

Europe as an aerial photographer/gunner assigned to the 94th Bomb Group, 8th Air Force, members of which he still keeps in contact.

He recalls those days with fondness as he does the many friends and colleagues he's made on his journey through life and the world as a geologist. Formally retired now, he remains active as a senior consulting geologist for the international engineering company Joshi Technologies out of his home in Tulsa, Okla. The 71-year-old pursues numerous "retirement activities" with the vigor and vitality of a youth, keeping busy with his church, his geology, the university and his health — and not necessarily in that order.

If he's not out walking or running or pursuing his interest in Sherlock Holmes as a bona fide member of the Afghanistan Perceivers, he draws upon his powers of memory to recollect his days at UIUC and a long career that has served as an extension of that education. His mental capabilities are as fit as

Lester and Ginger Clutter in Montana for a Montana Geological Society field trip.



his physical ones — there are no gaps in his memory and he certainly doesn't lack for stories.

As the war drew to a close, Clutter returned to the Midwest, where he waited out the remaining days of his military service at Chanute Air Force Base in Rantoul. He returned to civilian life as a photographer, the profession he'd begun after graduating high school in his home town of Cleveland. Ginger quickly re-entered the picture and the couple got hitched in June of 1945. She was working on her bachelor's degree in foreign languages at UIUC and suggested Clutter further his own, somewhat limited, college education.

He found himself back at UIUC, with expectations of applying his photography skills to the field of advertisement. Because the curriculum required he take a science course, the former airman landed in the geology class of Frank DeWolf. "I was very fortunate to have Dr. DeWolf," notes Clutter. "He presented this class in such a fashion that it was absolutely beautiful. I thought it was the greatest stuff."

So great, in fact, that he signed up for another geology course the following semester. The enjoyment he'd garnered from the first class wasn't a fluke, and aspiring advertising man Lester Clutter was now a geology major.

He received his BS in 1948, at a time when jobs in geology were scarce and few in his graduating class actually got jobs in the field, he recalls. He and Ginger were living in what was then known as Illini Village, a series of temporary housing units just east of Mt. Hope Cemetery. Ginger had returned to school to earn a master's in foreign languages and the couple just had their first daughter.

Clutter credits his wife for securing his first job. While he was putting around the golf course, Ginger received a call from Professor George White, then head of the geology department. "He told her about an opening with the Illinois State Geological Survey, did she think I might be interested. She said, 'Absolutely, he will be,' and so she signed me on."

He began his geology career as an oil well scout, reporting on well activity in the northern counties of Illinois. He kept that position for three years while working part-time on his master's degree — tuition, compliments of the Survey. Once a week he checked in at a scout meeting in Fairfield, where he often sat next to another scout who represented Gulf Oil. After nearly three years, Clutter began quietly looking for another job, and his friend from Gulf Oil obliged. Gulf called him three months before he graduated and offered him a job as a scout. Clutter accepted with the stipulation that he finish school first.

of that year, he was transferred to Tulsa and Gulf's sedimentation laboratory. He studied the subsurface structure of the Denver-Julesburg Basin, interpreting its lithology and using that information to help determine potential areas for drilling.

After his first son was born, the Clutters moved again to Billings, Mont. Ginger became pregnant with their third child, and Clutter, who was often away from the family, decided to find a position that would keep him closer to home. He joined the Sun Research Group as a subsurface geologist conducting carbonate studies of the Williston Basin of North Dakota from



Clutter with retired Shell Oil geologist Chet Garret in Big Snowy Mountain area of Montana.

"I've just been a lucky son of a gun all my life, I guess, but they put me on the payroll right there and then."

Clutter received his master's degree in 1951 and began a three year training program with Gulf. The family moved out west, where he worked as a surface geologist, mapping the rocky elevations of southwestern Colorado. In December

behind a desk.

But four years of desk work left him with the itch to move. After a three-year stint in the field with the Hunt Oil Company, he was, he says, bitten by the 40-year bug. And through the urgings of some friends to go international, Clutter signed on with the American Overseas Petroleum Company, landing in Tripoli, Libya, on Jan. 1, 1965. Having

sold the house and car, Ginger followed six months later with 18 pieces of luggage and four children in tow.

Clutter remembers it as a very exciting time, both for his family and his career as a geologist. Oil production was 10 times greater than what he'd seen at Williston and the geology was an amalgam of carbonates and sediments, sandstones, quartzites, dolomites and chert. The kids received excellent educations there and as political situations began to intensify in the Middle East, the younger children were sent to schools in Lebanon, Spain and the United States.

Just as the Clutters had traveled around America, even if somewhat involuntarily, Libya served as a base for traveling through the Middle East and Europe. And Ginger, not one to sit idle, was not afraid to take off on her own, says Clutter with pride. "My wife bravely drove through the desert with other ladies to places no woman had ever been to before."

Clutter spent part of his time training Libyans in the business of oil geology in a country that had only seen the profitability of its liquid gold mines in the late '50s. When Muammar al-Qaddafi became head of state in 1969, he was quick to realize the wealth and power that the oil-rich fields of Libya provided and made his own plans for future oil production. Foreign oil companies began to close down, and American Overseas was no exception. The company turned production over to the Libyans in April 1974.

After nine and a half years in the Middle East, Clutter was on the move again. After turning down a position in Indonesia, American Overseas co-owner, Texaco, offered him a job as chief development geologist in London, England.

"I was rather proud of one fact and that was the fellow who took over our company when we left was one of the guys I had trained and worked with. At least I knew that we had a guy who was a sincere geologist and wasn't politically minded. He just happened to be stuck in that situation."

Clutter's time in England often

mirrored that spent in Libya. While he was busy training young geologists, Ginger was learning the history and motorways of London. The couple traveled by bus every weekend to some new destination, much to the consternation of their British friends who'd never even heard of many of the places, boasts Clutter.

He worked on the discovery of the Tartan Field, an offshore oil site near the coast of Scotland, and spent three months working in that country, engaging his love for long walks and getting to know the local pubs along the way.

Again, he found himself too far away from his children who were, by the mid '70s, all back in the States. In 1979,



Clutter, left, with two South African Rotarians at Barnsdall, Oklahoma.

unable to get the transfer he requested through Texaco, Clutter returned to Tulsa and a job with the Mid America Pipe Laying Company (MAPCO).

Clutter suffered a setback in 1982 when it was discovered that he had a heart problem. He survived two coronary artery bypasses that year and walked away as an active member of the national organization, Mended Hearts, which offers support and advice to patients awaiting heart surgery.

"Just the sight of somebody who's actually been through it gives people a little stimulus to know that it's not all that scary," he says.

He worked for MAPCO until it sold its oil and gas division to Consolidated

Natural Gas in 1985. Clutter remained on board as a senior geologist and chief log analyst, attributing his rudimentary knowledge of log analysis to former UIUC Professor Jack Hough.

When Consolidated decided to move to New Orleans, Clutter took early retirement. Shortly thereafter, he was asked to stay on as a full-time consultant, a position he held for another nine and a half months.

Asked if the luck he's had in maintaining steady work can be attributed to his abilities as a geologist or to pure luck, he says, "I'd like to believe it's a combination of both. I know I've been fortunate, I've never been unemployed from the time I was a teenager until I took actual retirement in 1987."

Today, he's an active member of the Tulsa Rotary Club and the United Methodist Men's Group. He and Ginger still travel, tying together pleasure with humanitarian concerns such as the construction of a septic tank for a church-affiliated building in the mountains of Guatemala and a pastor's residence in Costa Rica.

The Clutters have been regular contributors to the University over the last several years, particularly to the areas of geology, geography and foreign languages. Due in part to this generosity, they were first invited to the president's annual fund-raiser at UIUC in 1988. The following year, he began to attend the GeoThrust Committee meetings as part of the Department's fund-raising efforts. Through his urgings and cooperation, the Department held a meeting for Tulsa geology alums this past April.

"Hopefully we'll be able to continue this sort of thing and maybe get to the point where everything that comes from this area be designated for one special project," says Clutter.

"Every individual should try and give something back to people. I do that through my church, and also through our Department because I've been very fortunate. If it hadn't been for George White and me getting that job out at the Survey, who knows what would have happened to me."

Faculty Profile:

W. Hilton Johnson

'It seems to me everyone ought to have a course in geology. You can't get away from it.'



Johnson decides it's time for a 'permanent sabbatical'

It's something he's been thinking about for a number of years, and he still hasn't made many specific plans other than he expects to eventually relocate. But at the end of the summer, Professor and Associate Head W. Hilton Johnson, M.S. 61, Ph.D. 62, will retire.

He's been in the Department continuously for some time—first as a student, beginning in the fall of 1958, and then as a member of the faculty in 1962. He'd only planned on teaching for two or three years after receiving his Ph.D. and then moving on.

"So 33 years later, I decided it was time," he said and laughed.

It was while he was an undergraduate at Earlham College in Richmond, Ind., that Johnson met then-Department Head George White on a field trip and was eventually recruited to come to the U. of I. Johnson served two years in the Army first. But he chose the U. of I., among several schools he considered, in order to study glacial geology and Quaternary geology.

"The Department at that time had a large graduate student population—larger than we have now and probably during most times here," he said. "I had good experiences as a teaching assistant. When I had the opportunity to

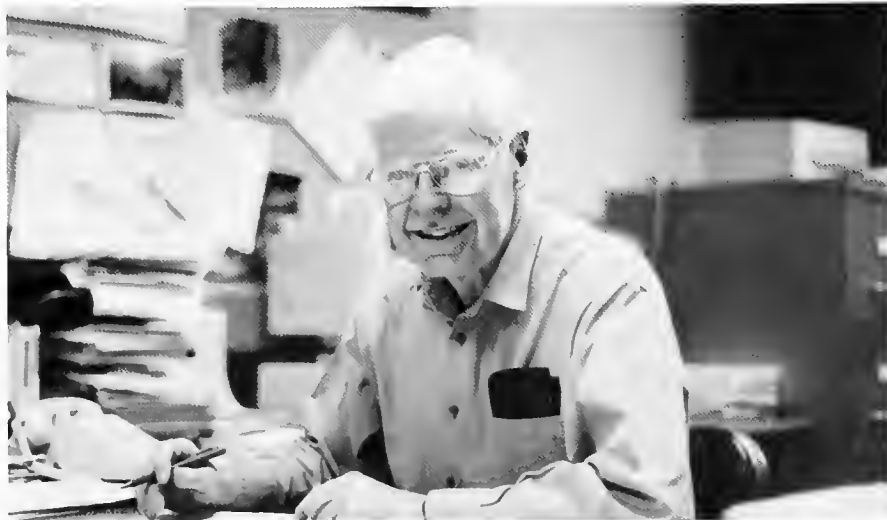
stay, it was mainly to teach some of the 100-level courses, particularly a course called 'Agricultural Geology.' It was that course that created the opportunity."

Since then, Johnson has had a variety of responsibilities in the Department—putting a different emphasis on what he does—that's made 33 years at Urbana more interesting and challenging. For example, he became involved in field camp immediately after he began teaching and has been active with it off and on ever since. He's also played a key role in the Department administration at various times over the years as Educational Coordinator and Associate Head.

Yet no matter what the job, Johnson has maintained common ground in his philosophy that is centered around the students.

"Well, I came from a liberal arts college," he explained, "and I think I was influenced as a teaching assistant by Fred Cropp and Mike Wahl, who were teaching some of the 100-level courses at that time. They proved to be a winning combination for Johnson. What he enjoys most about teaching is opening students' eyes to the Earth and

Johnson plans to work on some research projects that have been put on hold.



the importance of understanding and appreciating it. "It seems to me everyone ought to have a course in geology," he said. "You can't get away from it."

"It's bothersome and it's disappointing when, at the end of the semester, it's clear that you haven't reached some students. But by and large, you take the joy from those who do respond. I've had some very good classes in the last few years. I don't know whether I'm getting softer or they're getting better," he laughed. "They seem to be doing well, so I've been pretty pleased."

Field camp has always been a fun course for Johnson to teach, he said, because "that's where the geology is." Before the current cooperative Wasatch-Unita Geology Field Camp in Park City, Utah, U. of I. students went to Sheridan, Wyo. The memories of times spent with colleagues and students become special after living and working with them during intense 18-hour days every day for six to eight weeks. Saturday nights at the Sheridan Inn became classic.

"After an intense week, it was a time to relax and have some fun," Johnson said. "From the student side, I'm sure many of them will remember Crazy Woman Canyon—that was our first exercise every year and the parks trip to western Wyoming."

"For many students, (field camp) is often the high point of their undergraduate career. It's a time when they really begin to think, 'Hey, I'm a geologist.' They go out and *do* geology, so it's a very important part of their growth."

Johnson's work as an administrator in the Department has also been to help that growth process along. Throughout a good portion of the 1970s, he was the Educational Coordinator, which involved the instructional part of the Department. And then in the 1990s, he's been Associate Head and was Acting Head during the 1993-94 academic year. Much of his responsibilities have centered around the teaching assistants and scheduling classes and rooms in light of recent space problems brought on by several remodeling projects. "It's not so much dealing with students in

classes," he said, "but seeing that the whole operation moves as smoothly as possible without too many bumps along the way."

Despite all of his experience juggling these roles over the years, the current year has actually seemed as busy or busier than any. He anticipated the spring 1995 semester as having the largest enrollment ever. Even after adding eight labs and discussion sections since advanced enrollment, essentially every course was filled to capacity.

"I think the Department hopes to grow a little bit," Johnson said. "Obviously, we're teaching more. One of the reasons several years ago I decided to retire is I feel there's a need for new blood in the Department. I think it would be beneficial to have some



young faculty come in. Hopefully, this will make it possible. But it's still going to be tight. Actually, when I decided to retire, it was before all of this downsizing and departmental review.

"I'm sure there'll be days when I'll question what I'm doing," he added. "But in the long run, I think it'll be good for the Department."

One of the things Johnson hopes to do in his retirement is get to some of the unfinished writing and research that has taken a back seat to teaching and administrative duties. He is currently working with a colleague at the Illinois Geological Survey on evaluating the origin of a lot of the state's subglacial tills. Working from the recent idea that a lot of activity takes place beneath the ice rather than in the ice, much of the sediment may be a result of pervasive

deformation below the glacier. Through the sediment record, they are trying to determine the most appropriate origin. Johnson also is interested in writing more about relict permafrost features that formed just after glaciation.

"There are too many other unfinished projects that I may or may not work on," he said and then laughed. "I don't know. I've got enough to keep me busy. I know that."

"I suppose one of my limitations is that I can only do so many things at once. My priorities for the last few years have been teaching and administration, and some of the research has been left hanging. I've often used sabbaticals to write. So I'm sort of going on a permanent sabbatical—that's how I think of it (retirement) in one respect."

Johnson expects he will eventually miss the classroom and the student interaction. But for now, he's looking forward to the freedom of the next year or two for he and his wife, Joyce, to do some traveling. Depending on where they are, he is considering doing some part-time teaching or volunteer work. One of the courses he's taught in the Department for the last three years, "Geology of the National Parks and Monuments," is well-suited to a variety of locations and audiences.

"I know I'll have to find things to keep me busy," he said, "because that's all I've ever done."

The question now is where the couple will relocate. Oldest son Eric is in California, and the youngest, Scott, is in Seattle. But their daughter and only grandchildren (two girls) live in Cincinnati, Ohio. Johnson thinks they will probably go west—an area they both like very much.

"That's our problem. We have our eye on too many areas. From week to week, it's a different state."

But he won't sever those close-knit relationships that have been so important to him throughout his career. He'll continue to meet with his former students and colleagues at alumni functions and conferences regardless of where he and his wife end up.

"So until that happens," he said and smiled, "I'll be around."

Student Profile:

Wendy Gill

'I like it when things work.'



The fun is in the details

Neatness counts with graduate student **Wendy Gill**. Whether it's a 6,000-piece puzzle or the structure of clay minerals, she likes the way certain things fit together. That's one of the reasons why her research is focused on clays and organic chemistry.

"I like it when things work," she said. "I liked the way the material in introductory and even some upper-level science courses pull together neatly. Then you start doing research and discover that the scientific models are not as simple as they appeared. But that just made science more interesting."

While growing up in a suburb of Albany, N.Y., she always enjoyed math and science. So when she enrolled at Colgate University, she pursued a major in geology and a minor in chemistry. She originally was interested in marine geology. Her studies in that field included an exciting six-week semester-at-sea course offered at Wood's Hole Oceanographic Institute. Seventeen

students navigated the 135-foot brigantine, handled the sails and collected data for various research projects. Students collected sediment samples from the banks of a reef and measured oxygen, nitrogen and phosphorus concentrations in the water.

"That was my best semester," Gill said. "It was a different type of learning because it was not just lectures and book-learning. I learned more that semester than in any other semester."

When it came time to choose a graduate program, she had a choice between Hawaii and Illinois. The reason Illinois beat the exotic rival was because Gill wanted to find a program where she could combine her interest in clay mineralogy and organic chemistry. She had heard of Professor Steve Altaner's research in clay mineralogy. However, Gill's background in organic chemistry caught the attention of Department Head Jim Kirkpatrick, who uses Nuclear Magnetic Resonance (NMR) spectroscopy, a technique that is

Gill enjoyed the hands-on education of a semester-at-sea program.





Her teaching assistant duties have helped Gill prepare for the classroom full time.

commonly used in organic chemistry. When Kirkpatrick offered Gill a research assistantship, she thought it was a perfect opportunity to combine her two fields of interest.

"I thought that sounded like the perfect thing," she said. "It just seemed like a natural step, so I left Hawaii behind."

Gill's master's research involves studying the interaction of organic molecules with clay minerals. Initially, she used ^{13}C NMR spectroscopy to study the interaction of ethylene glycol and benzene in the clay mineral hectorite. Since the results were not very interesting, she began using ^2H NMR spectroscopy to study the dynamics and orientation of benzene molecules in hectorite. Gill found that the benzene molecules stand upright between the clay layers. Furthermore, she determined the relative speeds of different molecular motions from the spectral changes as she varied the temperature.

"Clays are used as liners for landfills," she said, "and so it is necessary to study the interaction of clays with organic molecules. Deute-

rium NMR spectroscopy is one technique that can be used to study this interaction. I started looking at benzene because its symmetry makes it a relatively simple molecule."

That's where Gill decided to stop her research, but she can easily see the possibility of another student continuing her work. "The next step in the research would be to introduce organic cations to the system because they help the clays better contain the organic molecules," she said.

Although it took some time for Gill to be comfortable with the decision, her current plans do not include a Ph.D. in geology. "Instead," she said, "I tentatively plan to either get two master's degrees, one in science and the other in the teaching of earth science."

"Teaching was always a possibility," she said of her decision.

When she wrote her resume as a senior at Colgate, she indicated her career objective of teaching at the secondary level, "but a professor who read my resume crossed it out and wrote, 'post-secondary education'!"

"I guess I felt that if I became a high school teacher, I would be selling

myself short. I thought I had to teach at the college level to have a stimulating career, but now I realize that can happen at the high school level as well. In fact, it can be even more rewarding to reach students at an earlier stage when they are still receptive to new ideas.

"It took me a long time to admit I didn't want to pursue a Ph.D. Before I changed my career plan, I had to prove to myself that it was a matter of discovering my real interests, rather than just quitting. I waited until after I presented my work at the American Geophysical Union conference to tell my adviser."

In the three years she has been at Illinois, Gill has been a teaching assistant for courses in mineralogy, petrology and introductory geology.

"I especially enjoy teaching at the introductory level because I see the students piecing together parts of a big picture. I also prefer interacting with people to working with instruments. I specifically asked to teach Geology 100 because I wanted to work with students who may have never studied geology before. It's good practice for high school."

Having taught at the college level, Gill believes she will have high expectations for her high school students.

"I've learned a great deal from conducting my research and writing my thesis," she said, "and I want to incorporate certain ideas in my high school lessons. I want students to be able to distinguish the facts and assumptions, and logically present and test their own hypotheses. I want them to be confident in their own ability to study some phenomenon and report their findings."

Choosing Illinois over Hawaii has never been cause for regret for Gill because, not only does she enjoy the research and teaching, she also met her fiancé, Rich Czerwinski, a doctoral candidate in electrical engineering. The couple are planning a June wedding. So in the next couple of years, Gill's goals and plans are expected to come together quite neatly.

Alumni News

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form you will find at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send a recent photo along, too, but let us know if you want it returned.

The following notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

OBITUARIES

Charles E. Greenwood, B.S. 49, of Houston, Texas, died March 20, 1994, at the age of 70. He had been employed by several petroleum companies during his career and was an oil consultant. He was a navigator and first lieutenant in the U.S. Army Air Corps during World War II. He received the Distinguished Flying Cross. Greenwood is survived by his wife, Mary, and several nieces, nephews and cousins.

Charles R. Dellenback, B.S. 52, M.S. 53, of Midland, Texas, died Oct. 26, 1993, at the age of 63. The U.S. Army veteran worked for Exxon and retired in August 1986 after serving as division geologic manager. Survivors include his wife, Priscilla, three children, one brother, one sister, four granddaughters and three nieces.

Ronald A. Younker, B.S. 57, of Olney, Ill., died July 25, 1994, at the age of 64. He was employed by Natural Gas Pipeline Co. of America for 25 years. In 1987, he was semi-retired and worked as a geologic consultant. He is survived by his wife, Joan, three daughters, five grandchildren, a sister and a brother.

C.S. Ho, a coal geologist who worked with Harold Wanless, died in 1991. He returned to Taiwan to a distinguished career in coal geology, as well as wrote the definitive geology of Taiwan. This report came to Professor Emeritus Ralph Langenheim, who encountered Ho in Taiwan in 1981 while working with the Central Geological Survey of the Republic of China.

Ellen Eades, of Gainesville, Fla., and wife of former faculty member **Jim Eades**, Ph.D. 62, died Dec. 1, 1994, after a prolonged illness.

FACULTY/STAFF

Emeritus Professor **George D. Klein**

was appointed in September to the New Jersey Beach Erosion Commission by Gov. Christine Todd Whitman. Klein retired from the Department in 1993.

Museum of Natural History Research Assistant **Steve Sroka** and his wife, Diane, welcomed the birth of their son, Jason William, on Dec. 15, 1994. He weighed 8 pounds, 5 ounces and was 21.25 inches long. Jason has a sister, Pamela, who is almost 6.

Research Associate **Corey Steffen** and his wife, Beth, had a baby. Tami Patricia was born Oct. 2, 1994, at 5 a.m. She weighed 7 pounds, 1 ounce and joins big sister Tiffany at home.

John Carter, former curator of the Paleontology Collections in the Department, recently completed a section of the Treatise on Invertebrate Paleontology and has been asked to complete a section begun by Jess Johnson, a paleontologist who died last summer.

Former faculty member **Don Deere** remembers enjoying life in the Department during the late '60s and early '70s.

A staff member in the late '50s and early '60s, **Frank Rhodes** will retire as president of Cornell University in Ithaca, N.Y., at the end of this academic year and reportedly will return to teaching in Cornell's geology department. He also was appointed chairman of the National Science Board, the governing body of the National Science Foundation.

Hans Peter Laubscher, a visiting professor from 1963-64, is currently trying to make sense of the Jura via computer-assisted construction of balanced sections. He enjoys an active retirement.

THIRTIES

W.M. "Bill" Decker, B.S. 39, and his

wife, Wanda, celebrated their 52nd anniversary with a Caribbean cruise in December. They plan to attend the March AAPG meeting in Houston and a September reunion in San Diego, Calif., of Decker's Navy patrol squadron VPB23. The World War II veteran worked for Cities Service Oil Co. after the war and retired in 1978. Then he became vice president of exploration at Jet Oil Co. in Tulsa, Okla., until retiring again in 1986.

FORTIES

Marvin P. Meyer, B.S. 41, M.S. 46, and his wife, Mary Belle, recently bought a condo in Jackson, Miss., where they go on the weekends from their home in Vicksburg to visit their children and dance at clubs to which the couple belong. They enjoy taking cruises, playing bridge and ballroom dancing. Meyer recalled his days on campus working for Professor Wanless, washing dishes at the Morris' Cafe and teaching dancing at Thelma Lea Rose's studio and on the top floor of the Illini Union.

Morris W. Leighton, B.S. 47, chief emeritus of the Illinois State Geological Survey, was the 1994 recipient of the John T. Galey Public Service Memorial Award from the American Institute of Professional Geologists. He also received a Gaylord Donnelly-Nature of Illinois Foundation Award in recognition of significant science and conservation efforts in Illinois.

FIFTIES

Three alumni received honors from the Rocky Mountain Association of Geologists in December: **Chuck Spencer**, M.S. 55, of the U.S. Geological Survey, Lakewood, Colo.; **Elisabeth "Betty" Rall**, Ph.D. 56, retired from Arco, Littleton, Colo.; and **Norbert E.**

Cygan, B.S. 54, M.S. 56, Ph.D. 62, retired from Chevron, Englewood, Colo.

William L. McKenzie, B.S. 50, is a self-employed, licensed geologist in Florida and is a petroleum consultant. He lives in Winter Haven, Fla.

Karl Goodall, A.B. 50, is semi-retired and enjoys spending time on his farm-ranch in Oklahoma City, Okla.

Professor of Economic Geology **Lawrence T. Larson**, B.S. 57, plans to retire from the University of Nevada after the 1995-96 academic year.

"Anyone who has worked as a department chair for X years has to view stepping 'down' as a promotion," he writes. In 1993, he returned from his second sabbatical in Turkey.

SIXTIES

On July 1, 1993, M.E. "Pat" Bickford, M.S. 58, Ph.D. 60, resigned as department chairman and Jesse Page Heroy Professor of Geology at Syracuse University to become a geology professor for 50 percent time. During 1993-94 he was on research leave and plans to retire in August 1997 when he is 65, but will be appointed research professor. Bickford has two active NSF-funded research projects: a study of the distribution of Archean lower crust beneath deformed Early Proterozoic orogenic rocks by isotopic methods—implications for the closure mechanisms in the Early Proterozoic Trans-Hudson Orogen in northern Saskatchewan, Canada; and a study of the details of tectonic history and deformation in the Grenvillian (ca. 1,250 million-1,100 million years ago) rocks of far west Texas by precise U-Pb age determinations.

Cotter Tharin, M.S. 58, Ph.D. 60, offers the excursion "Geology of the West Indies" on a chartered 49-foot sloop manned by his class of eight students.

Duane M. Moore, M.S. 61, Ph.D. 63, was promoted to senior clay mineralogist at the Illinois State Geological Survey. Since 1987 he has been a clay mineralogist in the Energy and Mineral Resources Group at the Survey. Last year he was invited to give a five-day short course in Indonesia on the effect of clay minerals in hydrocarbon exploration and exploitation.

Peter Ealey, M.S. 66, Ph.D. 69, is retired in Cornwall and doing "a bit of this and that." He recently had been on a job in Rio De Janeiro, Brazil. He is also a volunteer in the Museum of the Royal Geological Society of Cornwall.

SEVENTIES

William J. Byrd, M.S. 70, of Lincoln, Neb., is an adjunct professor at the University of Nebraska and is a consultant in Williston Basin petroleum geology and Nebraska environmental geology.

Harold Wilber, B.S. 71, M.S. 73 (LAS), teaches part time at Lincoln Land Community College in addition to his full-time position in the Springfield, Ill., schools.

Tom Chamberlin, M.S. 71, Ph.D. 75, was named chair of the Department of Physics and Earth Science at the University of Indianapolis.

Associate Professor **Sue (Mahlburg) Kay**, B.S. 69, M.S. 72, reported how she taught her classes on Tuesday and Thursday at Cornell University in Ithaca, N.Y., and gave a paper at the Seattle, Wash., GSA meeting on the Wednesday in between.

W. John Nelson, M.S. 73, was promoted to senior geologist at the Illinois State Geological Survey. He works in the Basin Analysis and Geophysics Section of the Geologic Mapping and Framework Studies Group.

Keros Cartwright, Ph.D. 73, principal geologist and head of the Hydrogeology Research Laboratory at the Illinois State Geological Survey, received a Groundwater Science Award last spring from the Illinois Groundwater Association for his lifetime commitment to research in groundwater science.

Craig B. Smith, B.S. 74, is the head of the Hugh Allsopp Laboratory at BPI Geophysics, University of Witwatersrand, in Johannesburg, South Africa. He works on Kimberlite and diamonds in particular and is trying to keep the research lab "solvent in the face of major funding shortages through a time of extreme political change." He and his wife's two sons "will soon likely require local area network installation in home—at least if the parents are to have any access at all to the computing facilities."

Bill Rice, M.S. 74, is the project supervisor on a Soil and Water Conservation Project in Kingsford, Mich.

Patricia Santogrossi, B.S. 74, M.S. 77, is coordinator of the Structural-Stratigraphic Framework Group, Gulf of Mexico, for Marathon Oil Co. She was program committee member and regional setting Gulf of Mexico chair for the GCSSEPM Research Conference on Turbidites in December. She is also a member of the AAPG Research Committee and the SEPM Membership Committee. Santogrossi is founder of Women Moving Up, a Houston-based program for women that bridges the gap between functional and practical

literacy, teaches life skills and encourages self-esteem.

Jack Sharp, M.S. 74, Ph.D. 74, is the Chevron Centennial Professor of Geology at the University of Texas-Austin. In 1994 he was on faculty research leave in Adelaide, Australia, where he was affiliated with CSIRO. His wife, Carol, obtained a Ph.D. in education and has returned to teaching after 20 years. Oldest daughter Katie attends the College of Wooster, where she has taken two geology courses so far.

John C. Steinmetz, B.S. 69, M.S. 75, is director of the Montana Bureau of Mines and Geology and state geologist in Butte, Mont. He previously was advanced senior geologist at Marathon Oil Co. in Houston, Texas.

Navy Cmdr. Martin P. Kauchak, A.B. 76, recently graduated from the Naval War College and was named the President's Honor graduate. He joined the Navy in September 1976.

Linda Tollefson, M.S. 79, survived another 20 percent downsizing last summer at Amoco Production Co. in Houston. She is now in the Egypt Exploration Group and hopes to see the pyramids.

EIGHTIES

Don H. Neeley, B.S. 80, is senior geologist at UEC Environmental Systems, Inc., in Gary, Ind., where he oversees field work, mapping, report writing and reviewing, is the customer and contractor liaison and office manager. "Rusty and I are doing well among the dunes of the National Lakeshore," he writes. "It's pretty good cross-country skiing for this area. Owen is 2 years old now and talking up a storm. His favorite films are *The Land Before Time* and *Sword in the Stone*."

David Rich, M.S. 77, Ph.D. 80, is director of data base management services for Grant Environmental in Englewood, Colo. His job is to build a department to sell Earth science data management products and services. He continues in his position as president of Geotech Computer Systems.

Karen Houck, B.S. 80 (Education), B.S. 80 (LAS), was invited to give a talk in the fall of 1993 at the AAPG meeting in Denver, Colo. She teaches sedimentology and stratigraphy at the University of Colorado.

Leslie R. Schenck, B.S. 82, is a fourth-year environmental litigation associate in the San Francisco office of the Seattle-based law firm of Lane Powell Spears Lubersky. She specializes in litigation of environmental claims and toxic torts. She and her husband, Tae Hong Joo, have two children, Hannah and Nathan, and reports that the family is happy with their new California lifestyle. "After three years at home with the kids," she writes, "I'm readjusting to the hectic pace of litigation and commuting. I still don't like the earthquakes, but the kids think they're great."

Bill Dawson, B.S. 74, Ph.D. 84, successfully weathered some recent "downsizing" at the Texaco Research Laboratory in Houston.

Ibrahima Diaby, M.S. 81, Ph.D. 84, is the director of the Mines and Geology Survey in Cote d'Ivoire on the Ivory Coast. He reports that the mineral development campaign is bringing more and more exploration companies to the Ivory Coast.

Karen Fryer, M.S. 82, Ph.D. 86, was promoted to associate professor of geology-geography at Ohio Wesleyan University in Delaware, Ohio.

Illinois State Geological Survey scientist **Keith Hackley**, M.S. 84, directed one of a number of summer research expeditions for high school students last year, sponsored by Johns Hopkins University's Center for Talented Youth. The project involved analyzing the long-term effects of urbanization on the biodiversity of adjacent wetlands near Crystal Lake, Ill.

Donald Von Bergen, M.S. 85, Ph.D. 88, is a physics and Earth science instructor at Salina South High School in Salina, Kan. He also teaches physical geology at Kansas State University-Salina, is developing an equipment-intensive, hands-on physics course called "Principles of Technology" at the high school and recently reviewed "Carbonate Sequence Stratigraphy" AAPG Memoir 57 for *NAGT (Journal of Geological Education)*. He enjoys rural life and learning about horses and farming.

Julie I. Wulff, B.S. 82 (Education), M.S. 86 (UIC), taught "Historical Geology" and "Rocks and Minerals" at Harper Community College in Palatine, Ill., and also is completing a share of an integrated science textbook for ninth-graders. The book is scheduled to be printed this summer.

Mark P. Fischer, B.S. 87, is a research geologist for Exxon Production Research Co. in Houston, where he characterizes and assesses the role of fault-dependent closure in hydrocarbon traps. He received a Ph.D. last May from Penn State and welcomed the birth of his second daughter, Kiah Amara, on Feb. 22, 1994. He expects to have some of his research published in *Geology*, *Tectonophysics* and the *Journal of Glaciology*.

NINETIES

Richard D. Kendrick, B.S. 90, of Mattoon received a master's degree in geology from Utah State University in Logan.

Andy Finley, B.S. 90, is a consultant in Casper, Wyo., who is currently on retainer with one client for 80 percent of his time.

Beth (Lind) Cahill, B.S. 83, M.S. 90, and her husband, Paul, welcomed the birth of their son, Mitchell Robert, on May 13, 1994. Their daughter, Diana, is now in kindergarten and "following in Mom's footsteps by collecting rocks and fossils, as well as insects, snake skins, pine cones and anything else of interest." She remains active in the Friends of Paleontology group, and Paul "is making a name for himself with Buckyballs, Buckytubes and flat panel displays." The family lives in Albuquerque, N.M.

Timothy H. Larson, Ph.D. 90, was promoted to geophysicist at the Illinois State Geological Survey. He works in the Groundwater Resources and Protection Section of the Groundwater and Environmental Geology Group.

Tom Corbet, Ph.D. 91, and his wife, Pam, welcomed the birth of their daughter, Andrea Kathryn, on Dec. 13, 1994. She weighed 8 pounds, 7.5 ounces. The family lives in Albuquerque, N.M.

Jay Matthews, M.S. 88, Ph.D. 92, and his wife, Karen, welcomed the birth of their son, Nicholas Sandy Engst Matthews. Dad's e-mail message: "At birth, 50 cm, 2.860 kg (about 6 pounds, 4 ounces), slate blue eyes and hair so blond he looks like a cueball! He's really sweet and calm."

Please take a few moments to let us and your class mates know what you've been doing: promotions, publications, election to office, marriages, parenthood, moving, awards. We'd all like to hear from you!

Name _____ Response date _____

Home address _____ Office Address _____
(indicate if changed)

Home Phone _____ Office Phone _____

Degrees from Illinois (with year) _____ Degrees from other universities _____

E-mail address _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
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Here

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**University of Illinois
at Urbana-Champaign**

Geosciences



**Department of Geology
Alumni Newsletter
Fall 1995**

University of Illinois at Urbana-Champaign

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in September and February of each year.

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Department of Geology Alumni Newsletter Fall 1995

GeoSciences

From the Department Head



Dear Fellow Alumni,

The start of a new academic year is a time of change and a little chaos. As usual, we have thousands of students starting courses, new graduate students settling in, and faculty members preparing for the semester.

Hilt Johnson has now retired, and I cannot pass up the opportunity to thank him again for all he has done for the Department over the past three-plus decades. Hilt was director of field camp the summer I took it, and he has been more-or-less keeping me out of trouble ever since. I will miss him greatly.

Albert Hsui is taking over from Hilt as Associate Department Head. I am very pleased that he has accepted the job. Albert is a geophysicist and is bringing great talent and energy to the job. He has been a major player in improving the Department's computer systems and in technology-based education.

We also want to welcome Eileen Herrstrom, Jerry Magloughlin, and Rōnadh Cox to the Department. Eileen is a teaching laboratory specialist and will be responsible for coordinating our introductory Geology labs and discussion sections and for teaching some of them. She comes to us from the University of Iowa, where she is finishing her Ph.D. in petrology. Jerry and Rōnadh are visiting assistant professors and will be teaching a variety of courses. Jerry has a Ph.D. in structural geology from Minnesota and has just finished a postdoc at Michigan. Rōnadh has a Ph.D. in sedimentology from Stanford and has just finished a postdoc at the Rand Afrikaans University in South Africa.

Technological advances are driving very significant changes in the way education is done at universities, and UIUC collectively is taking the lead in introducing these changes. The Department has put in place a new client-server computer system dedicated to instruction, which will allow our courses to have on-line exercises, discussion groups, and communication with faculty members and teaching assistants. The evidence from courses in engineering that have used these techniques is that both grades and student/faculty interaction increase. We expect similar results. The trick, which we must get right, is to take advantage of the computational power, information storage and retrieval capabilities, and communication capabilities of computers and networks to increase students' abilities to learn, while not losing sight of the need for the personal contact that is so much a part of exciting education.

A handwritten signature in dark ink, appearing to read 'R. Kirkpatrick'.

R. James Kirkpatrick
Department Head

Three new faculty members join Department

There will be some new faces around the Department this fall with the addition of three positions and a replacement for Visiting Assistant Professor **Fred Siewers**, Ph.D. '95. Siewers is leaving to accept a tenure-track position at Rock Valley College in Rockford, Illinois. Also departing is Assistant Professor **Tim Clarke**, who accepted a research position at New Mexico Institute of Mining and Technology, Socorro.

The Department has hired two visiting assistant professors and a teaching laboratory specialist, all of whom began this semester. A search continues for someone to oversee the Department's computers and networks.

Visiting Assistant Professor **Rōnadh** (pronounced Rona) **Cox** will teach the courses that Siewers had been teaching since **Philip Sandberg's** retirement in 1994. Cox's research interests are global change in sediment composition and the interaction of tectonic and sedimentary processes on a regional and global scale. She comes to UIUC from Rand Afrikaans University, Aucklandpark, South Africa, where she was a postdoctoral researcher. Her research project there examined sedimentology, tectonics, and geochronology of the Itremo Group, central Madagascar, and tectonic evolution of a Proterozoic sedimentary basin and its relationship to the assembly of Gondwana.

Cox received a bachelor's degree in geology from University College, Dublin, Ireland, in 1985 and a Ph.D. from Stanford University, Palo Alto, California, in 1993.

Her dissertation was entitled "Long-term recycling and evolution of classic sediments, southwestern United States."

Jerry Magloughlin is assuming a one-year visiting assistant professorship in the Department. He arrives by way of the University of Michigan, where he has been a National Science Foundation postdoctoral researcher since September 1993. His research interests are the evolution of mountain belts and high-strain zones in the Earth's crust, particularly in the North Cascade Mountains of Washington and the Grenville Province of eastern Canada. His work concentrates on the mapping, structural geology, metamorphic petrology, and geochemistry of metamorphic rocks; plutonic igneous rocks; and ductile and brittle deformed fault rocks.

Magloughlin received a bachelor's degree from the University of Minnesota-Deluth in 1983, a master's in 1986 from the University of Washington, and a Ph.D. from the University of Minnesota in 1993.

Eileen Herrstrom is the Department's new teaching laboratory specialist. She will coordinate the teaching assistant program, curate samples, and organize labs. Previously a geology instructor at Black Hawk College in Moline, Illinois, she received a bachelor's degree from Augustana College in Rock Island, Illinois, in 1977, a master's degree from Stanford University in Palo Alto, California, in 1979, and anticipates a Ph.D. from the University of Iowa in December 1995.

The computer position is targeted to be filled by the end of

October. That person will be responsible for maintaining the UNIX, Mac, and PC platforms throughout the Department and the internal networks; enhancing the Geology home page on the World Wide Web; and working with faculty members to create on-line modules for 100-level Geology courses.

Scott to receive 1995 Alumni Achievement Award

Professor Emeritus **Harold W. Scott**, A.B. '29 (LAS), A.M. '31, has been selected to receive the 1995 Geology Alumni Achievement Award, which will be presented to him at his Urbana home in fall 1995. This is the second presentation of the annual award, which honors a graduate of the Department of Geology who meets at least one of three criteria: a career of outstanding professional achievement; outstanding academic or research achievement; or outstanding service to the Department of Geology of the University of Illinois at Urbana-Champaign.

Scott was associated with the University of Illinois from the time he joined the geology faculty in 1937 until his retirement in 1967. He then served for six years as head of the Geology Department at Michigan State University, which honored him last year.

His research interests focused on stratigraphy and a number of

groups of microfossils, primarily ostracoda and conodonts, and sponge spicules and foraminifera. Scott is noted for the discovery of conodont assemblages. He also distinguished himself as a world-wide consultant to the petroleum industry and was involved in discovering major petroleum reserves in Libya. His work in the petroleum industry has taken him all over the world.

He has written numerous scientific articles, a treatise on invertebrate paleontology, and several books, including *The Sugar Creek Saga: Chronicles of a Petroleum Geologist*. The UIUC Department of Geology receives all proceeds from the *Sugar Creek Saga*. He belongs to many professional organizations, including the American Association of Petroleum Geologists, Geological Society of America, Phi Kappa Phi, and Sigma Xi and is listed in *Who's Who*, *Who's Who in the World*, and the *Writers Dictionary*.

Scott was chosen to receive the Alumni Achievement Award at the recommendation of the GeoThrust Committee and the Department Advisory Committee.

Alumni provide scholarships for field camp

Eleven field camp scholarships for the summer 1995 field camp were selected by the Undergraduate Committee. The recipients were Jeanne Burns, Brian Cabote, Stephanie Drain, Scott Ellis, Scott Elrick, Matthew Haverty, Soukthavy Heminthavong, Chris Korose, Dan Nolan, Blake Snodsmith, and Nat Stephens. The scholarships were provided by GeoThrust funds contributed by alumni.



Counter-clockwise from top left:—Department Staff Clerk Murle Edwards had some humorous awards to present to faculty members and students on behalf of the support staff. Graduate student David Voorhees was no exception.—Professor Steve Altaner presents undergraduate student Scott Elrick with the coveted Where's Waldo Look-A-Like Award.—Jeanne Burns and Carrie Nolan.—Graduate student John Werner was honored twofold for his TA work.—Professor and Associate Head Hilt Johnson was acknowledged for his upcoming retirement.—Scott Elrick, Dan Nolan, and Kevin Toohill.

Students reap awards

Faculty, staff, and students all gathered at the Illini Union on May 3, 1995, for the annual Department of Geology awards banquet. The following students received awards:

Morris M. and Ada B. Leighton Memorial Award: Douglas Tinkham
Estwing Pick Award: Nat Stephens

Outstanding Woman Graduate:
Student Award: Theresa Beckman

Outstanding Teaching Assistant Award: John Werner, Fall 1994
Theresa Beckman, Spring 1995

LAS College Award for Excellence in Undergraduate Teaching for Graduate Assistants: John Werner

Alumni Outstanding Senior Award:
Kevin Toohill

Field campers from 1977 and 1978 reunite in Sheridan

A reunion of the 1977 and 1978 Summer Geology Field Camp was held the weekend of July 15, 1995, in Sheridan, Wyoming. Early arrivals spent time at local battlefields. Friday night featured a dinner at the historic Sheridan Inn and a visit to the Mint Bar and Rodeo Street Dance.

On Saturday, the group went up Highway 14 and stopped along the geologic section. Organizer **Leah Rogers, M.S. '79**, reports that the section is now marked with road signs. "Even the elusive Darby formation is labeled" she writes.

They also visited Sand Point and Fallen City and hiked over the



wildflower slopes to the base of the Madison Limestone. The group later had lunch down on the igneous and metamorphic mapping exercise.

Dave Gallaher, B.S. '79, "provided a fine slide show on Saturday night before dinner, and lots of good tales were resurrected," Rogers says. "We plan to have another

reunion in the summer of 1998."

Other attendees were **Bob Babb, Ph.D. '81**, **Pete Hetherington, B.S. '79**, **John Morrone, B.S. '79**, and **Mike Kirby, B.S. '79**. Traveling from Bakersfield, California, Babb came the furthest distance. With a family of four, Gallaher had the largest family in attendance.

Open House welcomes 300 visitors

The Geology Club, made up of undergraduate students, welcomed nearly 300 visitors to a successful Geology Open House in March 1995. Held in conjunction with the College of Engineering's Open House, highlights of this year's exhibits included a demonstration of different types of earthquake waves, a map used to demonstrate triangulation for locating an earthquake, and a display showing the principles of convection.

The goal of the annual open house is "to try to attract new people to geology," said Cheryl Miller, one of the principal organizers. This year's high turnout was attributed to publicity in the engineering bulletin, a large sign on Green Street, and the fact that more geology is being taught to young school children.

Geology Club students who worked on projects this year included Jeanne Burns, Scott Elrick, Erika Goerich, Souk Heminthavong, Cathy Hier, Cheryl Miller, Dan Nolan, Lucy Samuel, Blake Snodsmith, and Nat Stevens.

Degrees conferred by the Department of Geology

October 1994

Yuehui Xiao, Ph.D.

January 1995

Lisa Lynn Gladen, B.S.

Xiandong Cong, Ph.D.

Ben Brandon Curry, Ph.D.

Fredrick deSchweinitz Siewers, Ph.D.

May 1995

Jodi E. Donovan, B.S.

Erika L. Goerich, B.S.

John A. Hoke, B.S.

Glen A. Howard, B.S.

Cheryl B. Miller, B.S.

Mike S. Nash, B.S.

Augustine E. Salazar, B.S.

Lisa R. Summers, B.S.

Kendall L. Taft, B.S.

Kevin R. Toohill, B.S.

Wendy A. (Gill) Czerwinski, M.S.

Marilyn M. Weiss, M.S.

August 1995

Brian S. Cabote, B.S.

Stephanie Drain, B.S.

Scott D. Elrick, B.S.

Soukthavy Heminthavong, B.S.

Daniel M. Nolan, B.S.

Bruce P. Miller, M.S.



She proves women have what it takes to succeed in science

By Clare Barkley

When Patricia A. "Tricia" Santogrossi, B.S. '74, M.S. '77, graduated from Ursuline Academy in Springfield, Illinois, and was ready to come to the University of Illinois at Urbana-Champaign, a relative advised her to go into engineering where opportunities for women would be greater than in other scientific fields. She did not take the advice but instead entered the university as an undeclared major in LAS.

"I wanted the freedom to choose a course of study for which I had a knack," says Santogrossi. "During my freshman year, I completed certain requirements and dabbled in the soft sciences and systematically ruled them out. As a youth, I was most interested in archaeology. An aptitude for chemistry led me to consider pharmacy for a time, until an older brother dissuaded me by painting an image of the boredom of pill counting. Geology, by contrast, has never been boring.

"It was fateful that my undergraduate adviser was James B. Risatti, a fellow Italian-American and, significantly, the first geologist I'd ever known. When the time came to take a physical science sequence, geology was by far the most appealing option. I soon knew that I had found the avocation that was an art as well as a craft, an investigative science that deals with some of the fundamentals of human existence on planet Earth—the perfect combination for me."

Santogrossi is currently the senior geologist in the Conventional Leasehold Group of the Gulf of Mexico Department of Marathon Oil Company in Houston, Texas. Her career has principally involved evaluating the structural and stratigraphic framework of basins in the Western Hemisphere, taking her from the North Slope in Alaska to the Magallanes Basin in southernmost Chile.

Santogrossi began her 20-year career as a summer research geologist at Shell's Bellaire Research Center (BRC) in Texas in 1975. Santogrossi says, "I received more lucrative offers that summer, but UIUC faculty members made me aware of the fine reputation of Shell's lab."

Her initial assignment was to evaluate the significance of an extended abstract that preceded Exxon's publication in 1977 of the now-famous AAPG Memoir 26 on seismic stratigraphy. The summer work was presented two years later when Santogrossi was invited to participate in Shell USA's first companywide Seismic Stratigraphy Conference at Woodlands, Texas. Santogrossi, among the one-third of the delegates with fewer than seven years' experience, was the only woman.

Santogrossi finished her M.S. in 1976. She took her first full-time job that same year after participating in the British Isles summer field course led by UIUC Professor Dennis Wood.

In October 1976, Santogrossi joined Shell's Alaska Division (later called Pacific Division) as a geologist. She spent two years (three field seasons) working in Alaska and one year in California evaluating the prospects of off-shore basins. She was a member of the first team (composed of three young geologists) to work on an off-shore lease sale (Sale 48), and one of the prospects she worked on became Arguello Field. Following that, she put in a two-year stint in the Rocky Mountain Division, where she was responsible for play development in the Williston Basin.

During her two years of basic training at Shell, Rufus LaBlanc, world-renowned sedimentologist now retired from Shell, predicted that Santogrossi would be the first woman manager at Shell. In fact, of the 43 Shell trainees, only 8 were left after the second year, and Santogrossi was the only woman. On her fourth anniversary with Shell, she was promoted to senior geologist, a step that previously had taken 7 to 10 years.

In 1982, she transferred to the Bellaire Research Center as a senior research geologist to develop, particularly for geologists, seismic-stratigraphic basin and prospect analysis techniques. Traditionally, seismic calibration using well control had been in the realm of geophysicists and was often focused at the reservoir level. Her research was performed on mixed clastic and carbonate systems of the Baltimore Canyon Basin, a portion of the U.S. Atlantic margin offshore of New Jersey. She developed whole-well calibration techniques and innovative documentation tools for seismic stratigraphic analysis and lateral facies prediction, for which she received a Special Recognition Award.

In late 1985, Santogrossi joined Pecten International, by that time a wholly owned subsidiary of Royal Dutch Shell. As the geologic coordinator stationed in Santos Basin, Brazil, she pioneered the use of computer-based interpretive databases and developed drilling operations methodology that is still used today. Also in Santos, her advanced understanding of the stratigraphy resulted in the naming of two new seismic sequences and the refinement of a third.

The object of her work was best realized, though, in the uncannily accurate predictions of turbidite-reservoir and source-rock parameters over 75km from control surrounding the only risk contract discovery to date in Brazil. She also conducted evaluations of the passive margin Magallanes-Austral Basins in Chile and Argentina, the forearc Manabi Basin in Ecuador, foreland basins in Argentina and Colombia, and an exotic terrane in Colombia.

"I soon knew that I had found the avocation that was an art as well as a craft, an investigative science that deals with some of the fundamentals of human existence on planet earth—the perfect combination for me."

She coordinated two phases of strategic evaluation of the Latin American (including the east African salt basins) and Sub-Andean theatres.

Ironically, it was also at Pecten that Santogrossi first heard that some of her managers believed that "women don't have it for science." At one point a manager refused to let her show some techniques she had developed. When she finally was able to circumvent his orders and show the work, it resulted in tens of millions of barrels of hydrocarbons in added reserves. Santogrossi says, "I was sure glad I hadn't been told that before. I might have been disillusioned." She went on to co-edit

(with Jack Edwards, who had retired from Pecten), *Divergent Margin Basins* (AAPG Memoir 48, 1990), the first of the five-volume World Petroleum Basin series.

"The best all around" is the way Santogrossi describes her next situation. In 1989 she transferred to Shell Offshore, Inc., in New Orleans, to become team leader of a large multidisciplinary exploration and production team that accomplished the predevelopment appraisal of the supergiant

Mars Field in Mississippi Canyon, Gulf of Mexico. "At ultimately 14 members—two each in such disciplines as geology, geophysics, petrophysics, geologic engineering, reservoir engineering, and drilling—we were the largest such team Shell had ever assembled. Two UIUC alumni, including

Geology alum **Bob Barnard**, M.S. '77, were on the team. My job was to coordinate the team efforts to formulate complex turbidite reservoir characterizations for more than 14 reservoir levels, to estimate reserves, and to design an optimal development plan. In addition, I was the focal point for information flow to several layers of management and conducted monthly technical meetings with

our partners. The privilege of working with so many focused and talented people has been the highlight of my career—in its first half.”

In 1991 Santogrossi was named province leader of a special study group at Shell Offshore, Inc., that established a link between velocity and basin type for the western slope basins of the Gulf of Mexico. In fewer than eight months, her small team solved a problem that had prevented successful exploration in prospects outboard of the Auger Field discovery; they effectively integrated an analysis of salt structures, seismic stratigraphy, interval velocity, and gravity data to rank trends in the slope province.

At Shell, since 1980, Santogrossi also had recruitment responsibilities, another area in which she faced skepticism by some male colleagues who thought a woman could not be successful in recruiting. She was on-campus recruiter at 11 universities, including UIUC. She also did Ph.D. recruitment at Yale, Johns Hopkins, Brown, and Columbia. She acted as recruitment resource to three successive chief geologists from 1986 to 1991.

By this time, Santogrossi had worked in every subsidiary of Shell, which was restructuring and downsizing, and was unsure that available opportunities could top the ones she’d had. In 1991, she joined Marathon Oil Company in Houston as a senior geologist in lease acquisition. Her work has centered on producing a structural and stratigraphic framework and play concepts in the Gulf of Mexico.

In fewer than eight months, her small team solved a problem that had prevented successful exploration in prospects outboard of the Auger Field discovery; they effectively integrated an analysis of salt structures, seismic stratigraphy, interval velocity, and gravity data to rank trends in the slope province.

Her return to Houston brought important changes in her personal and civic life. In March 1992, she married Joe Delasko, a senior electrical engineer with Baker Hughes in Houston, and she became active in volunteerism, a natural interest for her, as she says, “I come from an altruistic family.” It is not surprising that her biggest volunteer project is one that helps women succeed in the working world.

Her volunteer work with a literacy project began in 1992 when she joined Zonta, a 75-year-old international service organization of executive women. Zonta’s “Circle of Caring Through Literacy Project” began in late 1993, and Santogrossi was the first to chair the literacy committee of the Houston club. Seeking a focus for the club’s stated literacy mission, Santogrossi called Margaret Doughty, director of the Houston

READ Commission, the mayor’s coalition for literacy and the largest urban literacy coalition in the United States.

“The timing of my call was fortuitous,” says Santogrossi. “Margaret couldn’t believe we called. She had wanted to develop a program for vocational mentoring but needed qualified mentors. Now, she refers to this program as the ‘missing piece,’ is sharing the program with other coalitions

in the state, and expects it will catch on nationwide.”

Santogrossi was asked to design a program for vocational mentoring. The program, named Women Moving Up by the initial participants, brings together female literacy students at Houston learning centers with volunteers who teach them how to prepare to survive and succeed in the working world. At monthly sessions, the group discusses such topics as résumé writing, word processing, organizational skills, and work values. Smaller groups then meet for specific skill tutoring, particularly in reading and math.

But, according to Doughty, what the women appreciate most is Santogrossi's own story. "I come from an immigrant population family," Santogrossi says. "My father told me my grandfather could barely write, and my grandmother couldn't read or write English at all, yet she handled the family finances. My father, the youngest of five, might have left school at age 16 like his older brothers were it not for his teachers and others who helped him stay in school long enough to get an associate's degree. He had seven children, and each of us has an advanced degree in fields such as business, geology, audiology, and speech pathology. One of my siblings is a medical doctor, another a professor. I tell our women that's a lot of progress in just two generations. It doesn't take much intervention to break the cycle of poverty and illiteracy." Four of her six siblings are Illinois graduates: Fred '64, David '69, Mary '71, and John '80.

The executive women who act as mentors help the literacy graduates to identify career interest areas and introduce vocational opportunities that many of the women may not have heard of or considered.

Santogrossi enlarged on the idea of mentoring by arranging the first "job shadowing" experience last spring. Fifteen women, four of them hosted by Marathon, visited work sites where they experienced practical facets of the

working world. The plan is to continue and expand job shadowing and eventually to provide internships.

Santogrossi has been named "Outstanding Volunteer" (1993-94) for District 10 of Zonta, which encompasses 31 clubs in five south-central states. As a consequence of her spearheading Zonta's literacy project, the Houston Club won first place for literacy in District 10 and second in the na-

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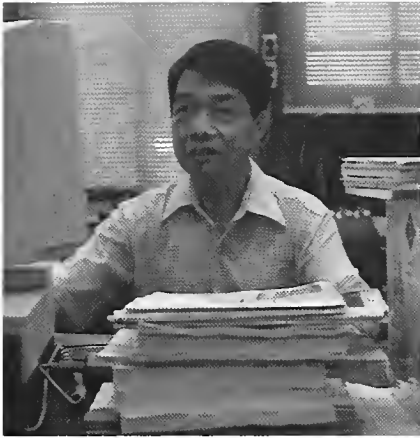
tion. District 10 was the Outstanding District in the nation that year. Santogrossi was named district literacy chair for the 1994-96 biennium. She also will be honored this fall as a "Woman of Excellence" by the Federation of Houston Professional Women for her years of dedicated professionalism, service, and achievement.

Although honors should be no surprise, Santogrossi says one was a surprise. In 1974, Geology Department Acting Head Hilt Johnson (representing the absent Fred Donath) arranged with a friend of Santogrossi's to make sure she attended a particular Friday colloquium. It was there that she was named Outstanding Undergraduate in Geology. Also at UIUC, she was inducted into Alpha Lambda Delta honor society for freshman women and Phi Kappa Phi honor society for science majors.

Santogrossi continues her involvement with the Department. She is co-chair of the Geo-Thrust Committee for Texas and Louisiana. At its annual meeting in fall 1994, the committee decided to organize the Department's part of Campaign Illinois by regions, and Santogrossi became co-chair with **Jack**

Threet, B.A. '51, of a drive to raise funds for a Texas-Louisiana Alumni Graduate Fellowship. Anchored by a large challenge grant offered by Threet, the initial goal is to raise \$300,000.

"We are very close," she says. "I know we will make it."



After a summer of research, new associate head prepares for fall

Professor Albert Hsui spent his summer vacation in California—only it was a working vacation. At the end of the spring 1995

semester, Hsui headed for Lawrence Livermore Laboratory, where he has been a participating scientist since 1993, to work on a project to study the evolution of sedimentary basins.

"This is not something new," he said. "In the past, I'd already done studies in the initiation and development of sedimentary basins. But the models I developed at the time were relatively simple because of the limited computing power at the time. Now computers are becoming more powerful every day. Therefore, more realistic models can be developed so that we can make better predictions."

This investigation is to learn, on the basis of three-dimensional

models, how fast a basin subsides and what its temperature and pressure histories are. Once those factors are understood, and if there are organic matters within the sediments, then it is possible to predict whether there is a potential for hydrocarbon products.

"This study has more practical applications," Hsui said. He started formulating and polishing the idea last December and prepared a proposal for the Department of Energy.

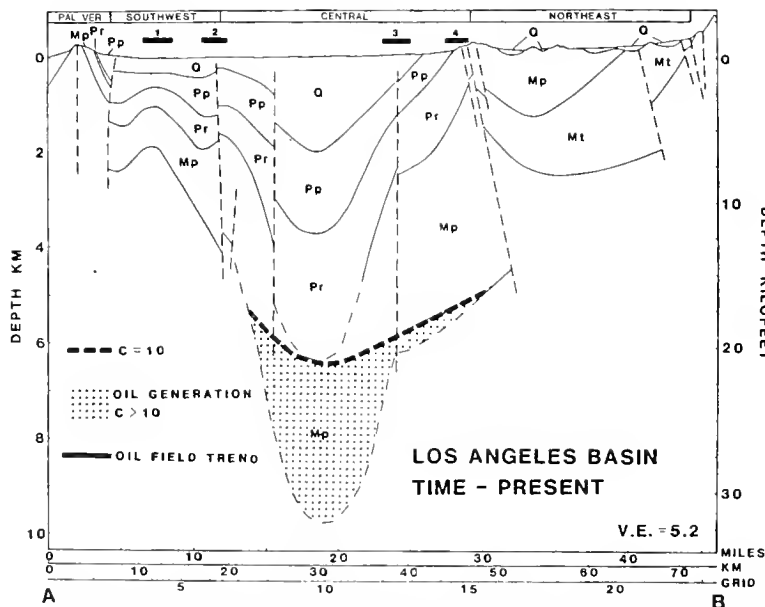
Another aspect of Hsui's research is the driving mechanism of plate tectonics. His focus is mainly on the understanding of the dynamics of the solid Earth—Why does the Earth's surface move? What drives plate tectonics? What are the flow patterns within the mantle?

"This is especially interesting in light of a recent discovery by Berkeley seismologists suggesting that earthquakes, at least in California, seem to have a cyclic behavior," Hsui said.

For example, there are times when there are a lot of earthquakes along the San Andreas Fault in California, then the fault becomes quiet and earthquakes of a different type occur in areas like the Cascade Mountains, off the coast of Washington and Oregon, and on up to the Aleutian Islands. Those areas also have a lot of active volcanoes.

"All of these volcanic eruptions may have something to do with the cyclic behaviors of the Earth's interior," he added.

"That's one thing we are trying to do some theoretical studies so we can have a better conceptual understanding of how the cyclic behaviors come about—to see



Sediments mature for oil generation are present in the deep Los Angeles Basin's Central Block. The oil field trends (1—Torrance-Wilmington Fields, 2—Long Beach Field, 3—Newgate-Santa Fe Springs Fields, 4—Whittier Field) follow the fault lines that have presumably allowed oil to migrate upwards. Little oil is found in the Northeast Block since it is essentially cut off from the oil source region.

whether the periodicity of those cycles can be predicted. Although this aspect of my research is expressed in terms of earthquake predictions and volcanic eruption predictions, it is a study of conceptual understanding of the fundamental science of the Earth.

Actual predictions could be a long time to come."

By summer's end, though, Hsui was back in Urbana preparing for his new role as associate head of the Department to succeed the retired Hilt Johnson.

"My duty is to assist Jim Kirkpatrick, our Department head, in whatever areas that he feels the need to delegate responsibilities," he said. "My understanding at this point is that I mostly will handle the educational aspects of the Department in terms of graduate and undergraduate education—teaching assistant

assignments, courses and curricula implementations, and the assurance of a quality education to our students when they come (to Illinois)."

He is unsure just how much of his time these new duties will take from his research and teaching.

"... I mostly will handle the educational aspects of the Department in terms of graduate and undergraduate education—teaching assistant assignments, courses and curricula implementations, and the assurance of a quality education..."

This semester, he will teach Geology 350, "Introduction to Geophysics," which he has taught since he came to the Department as an assistant professor in 1980.

Before that, Hsui was a research associate in geophysics and

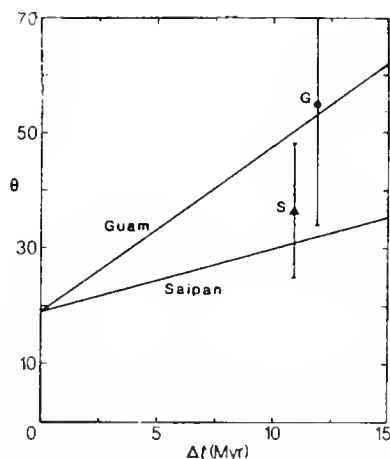
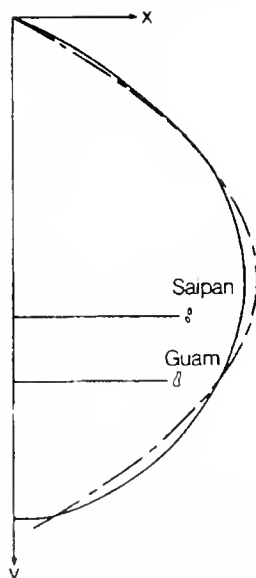
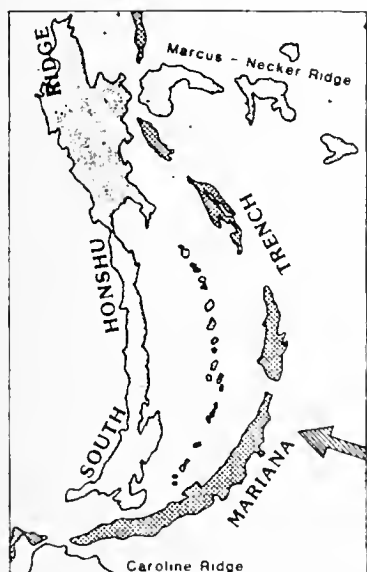
planetary physics for four years at the Massachusetts Institute of Technology in Cambridge. He graduated from the University of Massachusetts at Lowell in 1968 with a degree in mechanical engineering. He then went to Cornell for a master's in aerospace engineering and applied

mathematics in 1969 and a Ph.D. in aerospace engineering and geophysics in 1972.

"So as far as my background is concerned, I think many people may be shocked that I basically have had very little formal geology training at all," Hsui said. "I pretty much have learned everything on

my own."

He has done well. In 1994, he received the Arnold O. Beckman Research Award from UIUC and is associate editor for two journals of the American Geophysical Union—one on computational



The first figure shows the tectonic setting of the Mariana Trench. The second figure shows the curvature of the trench. The solid line is the observed curvature, and the dashed line is the theoretical curvature. The third figure shows the palaeomagnetic rotation as a function of time for Guam and Saipan islands. Observed rotations (S and G) are also plotted.

seismology and one on geophysical research. Back in 1991, he also received a "NeXT at Illinois" award to implement instructional innovations on a NeXT computer platform for Earth sciences. Hsui has been a key person behind the enhanced computerization of the Department.

"I have this dubious title of the coordinator of departmental computing facilities," he said. Those facilities are composed of two labs—157 Natural History Building (NHB) is for upper-level undergraduate teaching and 236 NHB is a Macintosh lab for undergraduates. It offers students access to word processing and spreadsheet programs and 100-level class exercises. The lab in Room 157 has eight Silicon Graphic work stations, a color scanner, and a slide maker.

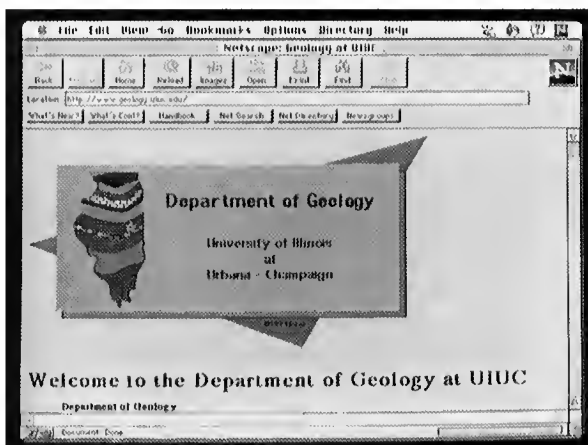
Upper-level instructional programs are created by individual faculty members for use by their students. For example, Professor Craig Bethke developed a program for his hydrogeology students to simulate groundwater flow patterns and to analyze the chemicals within groundwater systems. There are plans to design more 100-level exercises, as well.

"But in the future," Hsui said, "students may not need to come into the lab to do the exercises. They will be able to do them from their dorm room or home through the campus network or phone lines.

"The hardware is already being put together and should be up and running in the fall semester.

The difficult part is the software. It takes a substantial amount of time to develop these programs. As soon as they become available, we'll put them on-line. We envision that the complete implementation of this project will take at least a year or two."

Hsui has also used his computer skills to broaden the reach of the Department of Geology around the world with the development of a home page on the World Wide Web of the Internet. The URL address is



<http://www.geology.uiuc.edu>.

All of the Department faculty members and students are listed along with their e-mail addresses. It also includes undergraduate curriculum requirements, the types of majors offered, admissions policies and the like, with a corresponding section for graduate studies.

"This home page has been read by people all over the world," Hsui said. "We first designed it for students who may be interested in the Department. Certainly, we welcome our alumni to look at it and make suggestions. The home page is continuously evolving. We also list the faculty's

specialties and their research projects. However, that part is mostly still under construction. Right now there are only a couple of faculty members who have put their projects on the Geology home page."

The application of computer technology is an exciting part of Hsui's work, he said. And he appreciates the fact that UIUC is at the forefront of this revolution.

"I'm a theoretical type of person," he said. "So I use computers quite a bit. I'm really lucky to be at the University of Illinois and to be able to participate in this revolution. I find that I can do a lot more things than I could do when I was a graduate student.

"That's one thing I've been pushing in the Department—to make our students computer literate—because I think that it's a shame for any University of Illinois graduate to have fears of computers. That's part of the reason why I've been pushing and suggesting new curricula and incorporating computing into geological education."

It certainly seems like Hsui is juggling several balls at once. But he said now that the computers in the two labs are up and running, the labs operate themselves. With the help of graduate student Tien-hung Chu, the labs pretty much operate by themselves. Instead, most of Hsui's time is spent writing proposals and raising funds for such things as upgrading equipment and hiring programmers.

"Raising funds is just the name of the game," he conceded. "If I don't raise funds for the computers, I have to raise funds for my own research. So it's a matter of constantly writing proposals." Then he laughed and said, "I get quite used to it."

Profiles



A love of learning, teaching guide his work

It is gratifying to receive recognition for your work. When you put a lot of time and effort into that work because you truly love it, the recognition is even more sweet.

That's why graduate student and teaching assistant **John Werner** ranks his receiving a 1995 Harriet and Charles Luckman Undergraduate Distinguished Teaching Award—the principal campus award for excellence in undergraduate instruction from the university—as one of the best moments to date in his young career.

"I was extremely happy," he said. "I do put a lot of time into my teaching. It would have been worth it anyway, but this was just a tremendously uplifting, gratifying experience. What made me happiest and most proud was to know that many former students were willing to take the time to put down in words what sort of influence I had on them, what kind of teacher I was."

Werner is working on his Ph.D. in paleontology with Professor Daniel B. Blake after receiving his master's degree from UIUC in 1994. It took him a while. Werner came to the Department in 1990 from the California Institute of Technology in Pasadena.

Geology was actually his third field of study. He started out as an astronomy major and then changed to planetary science before landing in geology. Consequently, his senior year was spent taking some basic courses that most geology majors would take early on.

When the professor of his mineralogy course at Cal Tech, George Rossman, asked him what he wanted to do after getting his undergraduate degree, Werner decided he was going to do "something I could enjoy for a whole lifetime." Financial considerations aside, he chose paleontology and the desire to teach and do research at the college level.

"I told (Rossman) this, and he said, 'Well, Cal Tech is a good place to come to get a good grounding in the natural sciences before you go on to a place like the University of Illinois.' So that put a seed into my head."

When Werner arrived on campus, he entered a situation he knew nothing about. "I was extremely lucky," he says today.

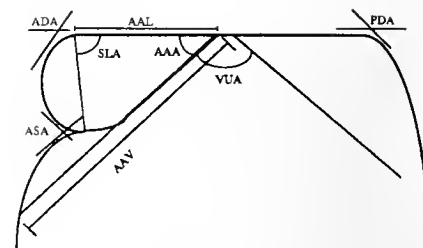
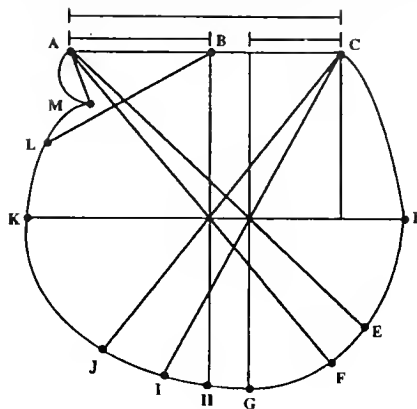
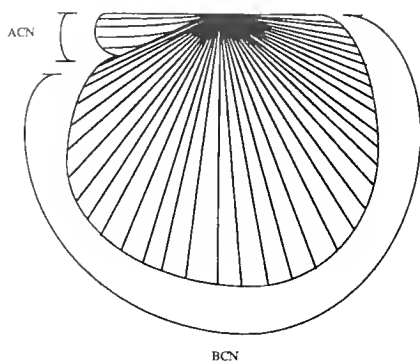
"I was interested in evolution and in natural history," Werner said. "To tell you the truth, I was never much of a fossil collector. Most of my interest was in modern animals. But I became interested in geology in college and

eventually saw paleontology as a way to integrate geology with my interest in organisms."

Following Blake's advice, Werner decided to get his master's degree before pursuing the Ph.D.—in retrospect, a choice he's glad he made. After going through that experience, he has many ideas to explore and has mastered the analytical skills. Now his current project is a morphometric approach to microevolution—the formation of species and evolution within a single species—of the scallop genus *Argopecten*.

"Morphometrics is basically the quantification of shapes," he said. "What I do is I take fossils and just measure the hell out of them. I take every conceivable character (i.e., linear distances, angles, number of costae or rib lines on the shell) and study all of the different scallops we have in different populations. What I try to do is track organism morphology through time."

To do this, Werner's most important equipment is what comprises the morphometric work station—a microscope attached to a video camera and a digital computer. When a specimen is placed under the microscope, it is viewed on the computer screen. Measurements can be made by simply pointing and clicking with the mouse. Another computer has the statistical software programs to run the data.



Morphometric evolutionary studies, such as the one Werner completed for his master's degree, usually involve the construction of a morphospace, an n-dimensional, statistical space wherein each axis represents one of the measured characters, such as the angles, rib counts, and linear measures taken on the scallops shown here.

"Right here we have one of the nicest setups of any paleontology lab anywhere," he said. "It's an incredibly helpful system and an amazing piece of technology."

It took four years for Werner to complete his master's thesis, so he's attempting to "crank it up a little bit" on the Ph.D. But he also hopes to follow through on some ideas he got from the master's project.

"Some of my ideas have been controversial," he said. "One of the major chapters in my M.S. was an attempt to look at various aspects of organism morphology and try to figure out what part of that is determined by the genetics of the organism and what parts are determined by the immediate environment. I thought I had found a good way to split these apart. I still think I've found it, but I think I overstated the case. And that's what my reviewers said when they rejected my paper. But I haven't given up on it. It's very exciting for me to be controversial; I don't want to be staid and boring."

That doesn't mean he likes to be controversial for controversy's sake. He spends a lot of time and

care on his analyses. For the master's project, he measured about 170 scallops and took 25 measurements of each.

"In terms of results, what made the biggest splash was a method I found for recognizing character displacement in fossil populations," he continued. "Character displacement is a phenomenon that we see when we have two closely related species living together and competing for resources. When I had two closely related species of the same genus living together, one of them was being displaced."

"I've been reading a lot lately on geometric morphometrics, which, instead of taking individual characters and making a morphospace out of them, is a school that was derived from craniofacial studies. Geometric workers take points on the skull, for example, and notice how they move relative to some base line. So that's basically what I did. I took that and applied it to my scallops. I like it because it allows a pretty good visualization of what's going on."

To save some time on his Ph.D. project, Werner is foregoing a lot of field work and getting most of his samples from museums. The specimens themselves are from Pliocene and Pleistocene sediments from Florida and upward along the Gulf and Atlantic coasts.

Admitting that he's not a field work fanatic, Werner was reminded that he received another award, the first Norman Sohl Memorial Award in 1994 for graduate field work in paleontology.

"It's to supplement my field work," he said and laughed. "It's not on the basis of any heroics on my past field work."

That doesn't mean there weren't any heroics.

Once on a Geology 108 field trip, there was a baby copperhead crawling around in a bush near some of the students. Werner picked up the snake with his rock hammer and flung the creature to a new locale in the canyon below. "I told (the students) to remember when they evaluated me that I had saved their lives," he said and laughed.

In addition, Werner has received the Outstanding TA Award in the Department for the spring 1994 semester and the College of Liberal Arts and Sciences Award for Excellence in Undergraduate Teaching in 1995.

But then, teaching, he said, is his first love. In fact, his mother, a junior high school teacher, enjoys telling of how a 5-year-old Werner announced one day that he was going to teach the family dog how to read. He proceeded to place an open book before their St. Bernard puppy with the instruction, "OK, Snoopy, first you have to learn the alphabet. A, B, C, D. . . ."

"Apparently I've been interested in teaching for a long time," Werner said, recalling the story.

If he had to choose one thing to do in his career, Werner said teaching would be it. One of the reasons he thinks that's true is because he enjoys learning so much himself.

"And teaching is learning," he said. "I've learned much more teaching courses than I ever did taking courses. There's also the aspect of the gratification you get from helping people. It's just a good feeling to know that you're having a positive influence in people's lives."

Werner likes to have a close rapport with students as soon as possible. That first day of lab can be difficult for him because he says it's not easy for him to talk to strangers. Once he gets to know people, he can talk more openly and be relaxed. He also prefers to commit his lectures to memory so he can "say what (he) wants to say, how (he) wants to say it." But he also has notes along to prevent him from getting off track or forgetting something. A sense of humor is also very important to his teaching style.

"I'm always cracking jokes in lab," he said. "I've found, though, that when I rehearse them and bring them up in lecture, they bomb. But when I ad lib, I usually kill 'em."

Werner also considers himself a hard grader, otherwise he isn't doing a student any service. But he is also quick to provide help when necessary during a lab and explain ideas to students.

Ironically, his teaching load will be lessened this fall because he's trying to gain some time on that Ph.D., which he realistically doesn't expect to complete for another two years. His major duty

now will be as a curator in the Museum of Natural History in addition to a Geology 143 lab appointment.

"I'm officially known as a

"Teaching is learning. I've learned much more teaching courses than I ever did taking courses."

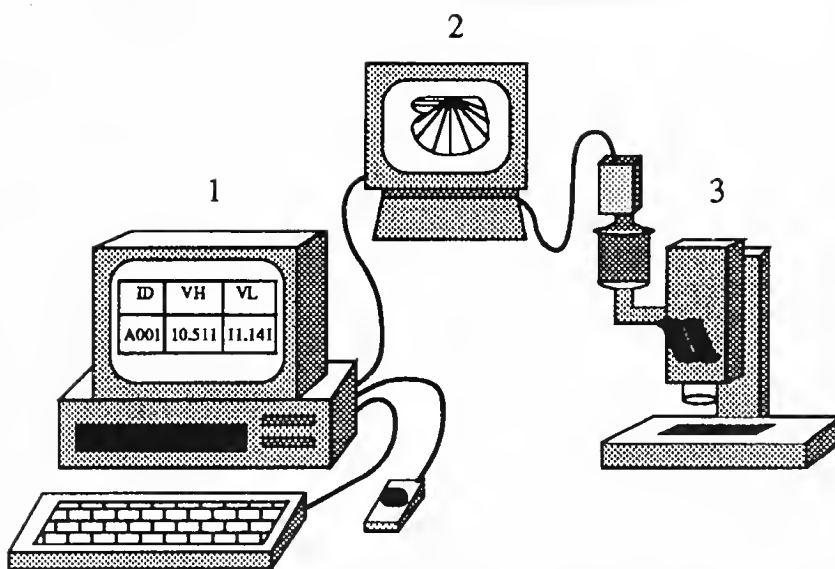
Stage 3 dissertation student," he said, "which means I've passed my preliminary exam. Right now I'm gathering data, going out to museums. I'm also writing up various ideas that came to me while I was working on my master's, and I'm trying to get them submitted to journals for publication."

When he was asked to identify his other interests outside of the

Department, he laughed. "My hobbies and interests are the stereotypical geologist's hobbies and interests—camping, hiking, fishing, star-gazing, and drinking beer."

But really, learning itself seems to be his top priority. After the Ph.D. is behind him, Werner ideally would like to find a position, perhaps at a small college, where he can continue to teach and conduct his research. He doesn't like to grade labs, and it can be a drudge to read so many research articles. Yet these minor nuisances pale when compared to the feeling Werner had when he passed the milestone of turning in his master's thesis and undoubtedly will feel again when the dissertation is done.

"If there was a higher degree than the Ph.D.," he said, "I'd probably go for that, too."



Sketch of the morphometric workstation in the Department's paleontology lab, which allows for increased speed and accuracy in the measurement of morphometric characters.

Alumni News

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

The class notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Obituaries

Charles Denard (Denny) Lee, M.S. '30, died January 22, 1995, at the age of 92.

He graduated from Southern Illinois Normal College and received a bachelor's degree in education from the University of Illinois in 1927 before beginning graduate study in paleontology here. He also worked at the Illinois State Geological Survey at that time. He taught at The Park School in Cleveland Heights, Ohio, from 1932-42 and then at University School, a private boys' school in Shaker Heights, Ohio. There, he taught biology, physics, and chemistry, chaired the Science Department for 13 years, and served as assistant coach of the track team.

During his summers in the 1940s, he led canoe trips at Camp Wabun on Lake Timagami. Other summers were spent pursuing

graduate studies, traveling, canoeing, and gardening.

He retired in 1969, and he and his wife, Dorothy Meffert Lee, wintered on the Gulf Coast of Florida. She died in 1973.

Lee eventually moved into a house next to his daughter, Marilyn Lee Fisher, in Leroy Township, Illinois, that was designed by the two.

She writes, "(My father) was fond of telling me that because I was born on graduation night (June 3, 1930), he didn't have to attend the ceremony. My father was a total success in living. Being a teacher he never had a lot of money, but he was an example of a kind, loving, and good person. His interest in nature, books, math, science, and just about everything else never waned."

Robert S. Dietz, A.B. '37, M.S. '39, Ph.D. '41, known for his once controversial but now established models of sea-floor spreading and meteorite impacts, died May 19, 1995, at his home in Tempe, Arizona, at the age of 80.

He was born in Westfield, New Jersey, and worked at the State Geological Survey during the time he was at Illinois. He also worked at the Scripps Institution of Oceanography in San Diego, California, before becoming a pilot in the Army Air Corps during World War II.

After the war, he began studying the ocean floor in earnest. He and Jacques Piccard collaborated on the development and use of the bathyscaph Trieste for crewed, deep submersible dives, and the two wrote about the descension into the Challenger Deep in the western Pacific in the book, *Seven Miles Down*.

Dietz was a professor of geology at the University of Arizona from 1977 until his retirement in 1985, when he was named professor emeritus. In 1992, he returned to Urbana to accept the LAS Alumni Achievement Award. He had also received the Walter H. Bucher Award, the Alexander von Humboldt Prize, and the Penrose Medal.

Dietz seemed to enjoy the role of outsider. Commenting on his work being recognized and accepted, he said, "It was more fun to be iconoclastic. I hate to be mainstream."

He is survived by two sons, a brother, six stepchildren and grandchildren, and his former wife, Nanon Grinstead Dietz.

Jack E. Harrison, Ph.D. '51, died June 2, 1995, at home in Lake-wood, Illinois, at the age of 71. He was a retired research geologist.

Harrison was born in Tipton, Indiana, and was a World War II Navy veteran. He married Joan Phillips in 1947.

He received his bachelor's degree from DePauw University in 1948 and worked for the U.S. Geological Survey for more than 40 years. In 1979, he received the Distinguished Service Medal from the U.S. Department of the Interior.

Harrison is survived by his wife, three daughters, his mother, a brother, and six grandchildren.

Mathias J. "Matt" Walters, M.S. '58, died June 25, 1995, in Oklahoma City, Oklahoma, from cancer. He is survived by his wife, Jeanette Thornburgh Walters, A.B. '58 (LAS), two daughters, one son, and seven grandchildren. He worked as a petroleum geologist for all of his professional career.

Twenties

A reminiscence about **Albert N. Murray**, Ph.D. '29, was featured in the December 1994 issue of *TU News*, the newsletter of the University of Tulsa's College of Engineering and Applied Sciences.

A young World War I veteran, Murray was the first geologist hired by TU and helped build it into one of the best in the country. He went there in 1928 as chairman of a one-person geology department. He was known as "Cannonball" Murray because students often took the round, 50-pound geological formation he used as a doorstop in his classroom and rolled it down the hall, past his office door. University of Illinois Professor Emeritus **R. L. Langenheim** recalled "rolling" the cannonball more than once at TU.

Thirties

A gift to the American Association of Petroleum Geologists Foundation was made in March 1995 in honor of **Harold W. Scott**, A.B. '29, A.M. '31, by **Jack C. Threet**, A.B. '51, to be applied toward its general fund.

Forties

Paul K. Sims, A.B. '40, M.S. '42, retired in July from his job as a geologist for the U.S Geological Survey in Denver, Colorado. He worked in the Hartville uplift in southeastern Wyoming on Precambrian geology.

K. O. Emery, B.S. '37, M.S. '39, Ph.D. '41, is senior scientist emeritus at Woods Hole Oceanographic Institute in Woods Hole, Massachusetts. He is a member of the American Academy of Arts and Sciences and the China Academy of Science. He received an Alumni Achievement Award from the Illinois Alumni Association in 1977 and has written more than 360 journal articles and 15 books, mostly on various aspects of oceanography.

Fifties

William L. McKenzie, B.S. '50, of Winter Haven, Florida, is retired because of health reasons.

Richard H. Voris, M.S. '52, of Tulsa, Oklahoma, retired in October 1992 and is now a consultant geologist.

Sixties

Robert F. Lundin, M.S. '61, Ph.D. '62, is a professor of geology at Arizona State University in Tempe and will change his status to professor emeritus when he retires in August. He taught paleontology and stratigraphy at ASU for 33 years. "Retirement," he writes, "hopefully, will allow me the time to complete some major research projects which are presently underway."

Seventies

Chang L. Lin, Ph.D. '70, is assistant deputy minister of the Office of Environmental Technologies in Nova Scotia's Department of the Environment. His role is to promote environmental innovation and technology cooperation domestically as well as globally.

Before his current position, he was an assistant to the deputy minister; acting director of policy, planning and coordination; and chief of water resources planning. He has been with the government of Nova Scotia for more than 25 years. He has two sons—one an industrial engineering graduate and the other is currently in Harvard's doctoral program.

H. Richard Naslund, B.S. '72, is a professor of geology at the State University of New York in Binghamton and chair of its geological sciences and environmental studies. He was promoted to his current position in May 1995 and will spend the academic year in Chile on a Fulbright Scholarship. His wife and children, Sterling (8), Skye (6), Neelam (3), and Cambria

(1) will spend the year with Naslund at the University of Chile in Santiago. He invites UIUC geology alums in Chile or who will be visiting Chile then to look him up.

Stephen Chicoine, B.S. '72, married Mary Ann Ray on June 3. He is vice president of Bechtel Energy Resources Co. in Houston, Texas. He says his first book, *Lithuania: The Nation That Would Be Free*, has been published by Cobblehill Books and released, and he is now negotiating for his second book.

Nahum Schneidermann, Ph.D. '72, is director of international technical relations for Chevron Overseas. He is also chair of the AAPG international liaison committee and technical co-chairman of the 1995 Nice AAPG/IFP conference and the 1996 AAPG/SUG Caracas conference. In 1994, he received honorary membership in AAPG and the Nigerian Association of Petroleum Explorationists. His wife, Sheila, is finishing a master's degree in clinical psychology. Daughter Michelle, who was born in Urbana, is in Dartmouth Medical School, and son Ron is a junior in high school.

William I. Ausich, B.S. '74, is a professor of geological sciences at The Ohio State University. He has just begun a term as special publications co-editor for the Paleontological Society.

Christopher T. Ledvina, B.S. '74, was granted tenure and promoted to associate professor of geology at Northeastern Illinois University. He is also founder, chairman of the board, and CEO of the National Museum of Coal Mining. The museum is developing a 700-acre modern, underground mine complex and a 100-acre historic mine for research, exhibits, and historic preservation, he writes. The museum is in West

Frankfort, Illinois, and will open in the fall of 1996.

Richard Lahann, Ph.D. '75, is senior research associate of the Reservoir Properties Group for the Conoco Technology Division. He writes that he is "a somewhat dazed survivor of nine years of downsizing" and is "still looking at rocks and the occasional clay mineral."

Jean Kulla, M.S. '75, Ph.D. '79, and her husband, **Ted Koelsch**, M.S. '77, Ph.D. '79, report they were enjoying the rain, and sometimes sun, in southern California this past spring. Jean gets to Chicago about every other month to do consulting work for Argonne National Laboratory but hasn't been to Urbana in more than 15 years.

Mike Kirby, B.S. '79, is a project manager for Ecova Corporation, an environmental firm that does gas station work (USTs, remediation, and assessments) in Missouri, Iowa, and Illinois. He is a CPG and sits on the legislative committee for the Missouri chapter of the American Institute of Professional Geologists and is a PG in Tennessee and a registered groundwater professional in Iowa.

He's back in the Midwest after 13 years in Texas. He was in and out of the oil patch for 8 years, he writes, and 4 years in environmental work. He taught geology as an adjunct at Houston Community College for 8 years and produced an environmental video for the college that is getting wide distribution in Houston and rave reviews.

Eighties

Zakaria Lasemi, M.S. '83, received the Outstanding New Staff Member Award for 1994 from the Illinois State Geological Survey. An assistant geologist in the Oil and Gas Section, he was honored for his work in the field relationships of modern and ancient carbonate sediments and rocks and the understanding of limestone formation. He also developed a depositional model of two rock formations in the Illinois Basin that may be useful for oil exploration.

After **Joe Schrodt**, M.S. '81, Ph.D. '83, graduated, he worked for an oil company in seismic data acquisition and borehole geophysics research groups. Then he was an acoustician for the U.S. Navy and now works as a seismologist for the U.S. Air Force. He recently worked on negotiations for the Comprehensive Nuclear Test Ban Treaty. "In all these years," he writes, "I have never worked in my area of expertise, which was rock physics."

Schrodt also had some sad news to pass along to former classmates. He contracted acute myelogenous leukemia, a fast-acting cancer in the blood stream, and has survived four rounds of aggressive chemotherapy. He is now in remission and back to work after nine months off. "My family and I received much-needed support from many people," he says, "including many friends made at the U. of I."

His older daughter, Julie, who was born a year and a half before he graduated, is now 13. He also has another daughter, Lisa (11), and a son, Kevin (8). They all enjoy living near the beach (Satellite Beach, Florida) and play sports year-round.

"I am grateful to the Geology Department, which in the end was part of my life that helped make me stronger in my convictions, more well-educated, and better able to overcome obstacles in life," Schrodt adds. "I'd like to say hi to any old friends there at the Department and to wish everyone there good health and happiness in their lives."

"I would appreciate any response to this letter. My e-mail address is jschrodt@aol.com."

Bruce Phillips, M.S. '86, is head of the Hydrogeology Section of Martin Marietta Energy Systems at the Paducah (Kentucky) Gaseous Diffusion Plant. He is currently tackling some "world-class" groundwater contaminant plumes—"tough to do with a dwindling budget," he says. He also teaches physical geology at Paducah Community College—"putting all that Geology 101 TA experience to work. (Thanks, Hilt!)"

Nineties

Richard Poskin, B.S. '91, teaching assistant in Eastern Illinois University's Zoology Department and his colleague, Edward Moll, were among four recipients of the 3rd Annual Linnaeus Fund Awards for 1994. The awards are for turtle research and administered by the Chelonian Research Foundation. The two will use the grant to continue their study of the false map turtles in Illinois.

Mary Ann Glennon, Ph.D. '94, works at Argonne National Laboratory on decommissioning buildings using geophysics (EM, magnetics, and GPR) as a first step. She doesn't have to do the field work but is responsible for writing the reports. She says she's learning a lot about interpreting EM, magnetic, and GPR data quickly.

Let's Keep In Touch!

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; e-mail geology@uiuc.edu.

Name _____

Response date _____

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Degrees from Illinois (with year) _____

Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
Stamp
Here

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GeoSciences

Department of Geology Alumni Newsletter Spring 1996

About Our Cover:

A sample of pseudotachylyte magnified 500 times reveals tiny crystals called microlites that grow within the melt at approximately 800 degrees Celcius. Under the right conditions, pseudotachylyte is formed along the actual sliding surface of a fault where an earthquake has occurred.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in September and March of each year.

Staff Department Head: R. James Kirkpatrick; Asst. to the Head: Peter A. Michalove; Editor: Vanessa Faurie; Production: LAS Office of Publications; Administrative Secretary: Pat Lane

From the Department Head




Dear Fellow Alumni:

Like the last few years, this one is turning out to be both busy and full of change. Eileen Herrstrom, our new laboratory teaching specialist, is doing an outstanding job with our expanding enrollments in introductory courses. Our two visiting assistant professors, Jerry Magloughlin and Rónadh Cox, have contributed significantly to introductory courses and by reorganizing our courses in sedimentary geology and mineralogy. You will find features on all three in this issue.

We are also very excited about the imminent arrival of Stephen Hurst, who will be a research programmer. Steve is a geologist by training and comes to us from Duke University, where he was a research assistant professor. He will help us develop on-line teaching modules such as virtual field trips and computer simulations of geological processes. Interactive software will be a major aspect of geological education in the coming years. We already have extensive capabilities in this area, and with Steve's help, we plan to be leaders in the field. Steve also will be responsible for maintaining and upgrading the Departmental computer facilities and for maintaining our home page on the World Wide Web. Many of you have already viewed our home page, and we have received class notes, alumni comments and queries from prospective students at the site. Visit us at <http://www.geology.uiuc.edu/>.

This issue of GeoSciences also contains an article about the very successful fellowship endowment being put together by Illinois Geology alumni in Texas and Louisiana. I want to take this opportunity to thank Jack Threet and Patricia Santogrossi, who spearheaded this effort, and all the alumni who are contributing.

As always, we are glad to hear from you. Let us know your thoughts about the Department and keep us informed about news in your life. If you are on campus, be sure to stop by to see us.


R. James Kirkpatrick
Department Head

Texas-Louisiana Alumni Fellowship reaches goal

The Texas-Louisiana Alumni Fellowship for the Department of Geology has been deemed a success for meeting a goal of \$300,000 to be placed in an endowment that will generate a permanent stream of income to support a graduate student fellowship.

Jack Threet, B.A. '51, and **Patricia Santogrossi**, B.S. '74, M.S. '77, two members of the Geo-Thrust Committee, spearheaded this plan in conjunction with the University's ongoing \$1 billion capital campaign.

Alumni in Texas and Louisiana were contacted to pledge contributions over a period of four years (1995-98). Pledges of close to \$150,000 have been received to date, with a matched \$150,000 coming from Threet himself.

Each year, 5 percent of the earnings on the principal will be withdrawn to provide the fellow-

ship to an outstanding graduate student. Income earned in excess of 5 percent of the principal each year will be reinvested to increase the income base and allow for an increase in the dollar amount of the fellowship in future years in response to inflation.

In a letter that was sent to alumni in both states, Threet and Santogrossi said, "... support for students is one of the most effective forms of support we alumni can provide."

It is hoped that the project will become a model for additional group gifts from Illinois Geological alumni in other parts of the country.

Lester Clutter, B.S. '48, M.S. '51, for example, is organizing a similar project in Oklahoma and Kansas. The goal for alumni in these states is to raise \$20,000 to support an annual Geology class field trip during Spring Break.

Students honored with awards

The Structural Geology and Tectonics Division of the Geological Society of America presented its annual outstanding student research award to graduate teaching assistant **Timothy Paulsen** for "The Structural Geometry, Kinematics, Strain and Tectonic Significance of the Mount Raymond Thrust: A Major Transverse Zone at the Southern Margin of the Wyoming Salient, Sevier Orogenic Belt, Utah." His adviser is Professor Stephen Marshak.

John Werner received the University of Illinois Graduate College's On-Campus Dissertation Research Grant. He is working with Professor Dan Blake.

Mindy Tidrick was named the Department's Outstanding Teaching Assistant for the Spring 1995 semester.

Crystal Lovett, a junior from Stafford, Virginia, received the American Geological Institute's Minority Geoscience Scholarship (AGI-MPP) for the 1995-96 academic year. Award recipients must be geoscience majors who are U.S. citizens and members of ethnic minority groups that are underrepresented in the geosciences. Individual scholars are selected by the AGI-MPP Advisory Committee because the student appears to have particular potential for success in the geoscience profession. The awards are supported by funding from the National Science Foundation and by contributions from geoscience corporations, professional societies and individuals.

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Jack Threet
Anonymous



Scott accepts Geology Alumni Achievement Award

As announced in the Fall 1995 issue of *GeoSciences*, Professor Emeritus **Harold W. Scott**, A.B. '29 (LAS), A.M. '31, received the 1995 Geology Alumni Achievement Award.

The presentation was made at a Nov. 3 ceremony in his Urbana home by GeoThrust Committee chair **Haydn H. Murray**, B.S. '48, M.S. '50, Ph.D. '51, Department Head **Jim Kirkpatrick**, Assistant to the Head **Peter Michalove** and Administrative Secretary **Pat Lane**. Some of Scott's family members also were present for the event.

Correction

In a photograph on page 4 of the Fall 1995 *GeoSciences*, Department staff clerk **Murle Edwards** presented an award from the support staff to research assistant **Dave Finkelstein**, who was misidentified.

Harold Scott (seated) receives the Geology Alumni Achievement Award for 1995 from Haydn Murray.

The GeoThrust Committee and the Department Advisory Committee selected Scott to receive the second of a now annual award honoring alumni from the Department who have excelled in their professional, academic or research achievement or who have been of great service to the Department.

Scott was associated with the Department for 30 years (1937-67) and then headed the Geology Department at Michigan State University for six years. From the discovery of conodont assemblages to petroleum reserves in Libya, Scott has enjoyed a long and distinguished career as a geologist, as well as an educator.

New computer expert joins Department

Steve Hurst, formerly of Duke University, has joined the staff as a research programmer to serve as the resident systems analyst for the Department's computers.

He has extensive experience doing a variety of geological research and developing computer materials for teaching geology. His demonstration for the job opening featured a virtual field trip to Hawaii, complete with a look inside a volcano, a person taking a rock sample, and focusing in closely on a piece of lava. Hurst will also develop on-line teaching materials and work with Associate Head **Albert Hsui** on the continuing enhancement of the Department's home page on the World Wide Web.

Check It Out!

<http://www.geology.uiuc.edu/>



Christmas Party

The holiday season was celebrated in the Geology Department's Wanless Room (the student lounge) December 8 with plenty of food and fun, including the good-natured presentation of several gag awards to individuals.





Top: Jim Kirkpatrick makes the presentation of a camping stove to the Johnsons; below: Joyce and Hilt Johnson; lower right: Ardeth Hansel (left) of the Illinois State Geological Survey collaborates with Johnson on some research projects.

Friends tout Hilt Johnson's retirement

More than 60 friends and colleagues gathered Aug. 31 in the elegant setting of the Festival Theatre lobby in the Krannert Center for the Performing Arts to pay tribute to Professor and former Associate Head and Acting Head **Hilt Johnson**, M.S. '61, Ph.D. '62, upon his retirement from the Geology Department.

Joined by his wife, Joyce, Johnson was the guest of honor for dinner, with remarks by research collaborator **Ardeth Hansel**, Ph.D. '80 (LAS), Professor Tom Anderson and Department Head Jim Kirkpatrick. Several

gifts also were presented, including a world atlas and a camping stove.

The Johnsons plan to do some traveling, however, Johnson still has a couple of students in the Department with whom he is continuing to work. So Johnson still has an office in the Natural History Building and has remained involved in the Department.

Sept. 21
ILLINOIS VS. AKRON
Mark Your Calendar

Attend a Geology Alumni Party on the Urbana campus during the football weekend of Sept. 21, 1996, when Illinois takes on Akron. Watch your mail for more details.

Profiles

Places to go, things to do: Rōnadh Cox

The world is a small but fascinating place to Rōnadh Cox.

She has Irish citizenship, but is a permanent resident of the United States. She studied in Ireland, then Louisiana and then Stanford. She did a postdoc in Africa with research in Madagascar, and now finds herself a visiting assistant professor at the University of Illinois, teaching "Earth and the Environment," "History of Life," sedimentology and field geology.

It's been nice how geology has allowed her to make her way around the globe. It's no wonder her research interests focus on "global change in sediment composition and the interaction of tectonic and sedimentary processes on a regional and global scale."

As excited and amazed as she is about the geological world around her, it is a bit surprising to learn Cox started out her college education at University College Dublin in Ireland studying zoology.

"When I got to college," she said, "I found that most of the zoology that was being done at the university was very biochemical and lab-based."

The university system in Ireland differs from that of the United States. Cox had a science-

oriented curriculum from which to choose her initial classes. Not liking physics, she took geology, biology, mathematics and chemis-

"When you put Africa and India back together again, there's a gap. And Madagascar fits somewhere in there, but we don't exactly know how."

try the first year. By the end of her second year, she had to qualify for what would be her honors major. She qualified in geology and pursued it from then on.

"I find it a fascinating subject. Also, geology was a way to be outdoors, deal with exciting concepts," she said and then laughed. "You know, you get to take a honking great big sledgehammer and beat on a boulder. It's fun. What can I say? I get to spend a significant portion of my life outdoors and get paid for it."

"Rocks are interesting. We're talking about dealing with why the Earth is here, why that mountain is there. These are very fundamental ideas and also very exciting concepts, so they're very intriguing to work with."

She wanted to work on a Ph.D. but decided not to do it in

Ireland. She went to Louisiana and worked with Donald R. Lowe "just to be somewhere different." When he moved to Stanford University, Cox transferred there and completed her dissertation, "Long-term recycling and evolution of clastic sediments, southwestern United States," in 1993.

She and her American husband and fellow geologist, Mark Brandriss, both went to South Africa to do postdoctoral research soon after. Cox was a researcher for the next two years at Rand Afrikaans University in Johannesburg.

Her research project took her to central Madagascar to analyze the sedimentology,

tectonics and geochronology of a Proterozoic sedimentary basin and its relationship to the assembly of the supercontinent Gondwana.

"One of the reasons we're interested in working on this is nobody knows exactly how old the (Proterozoic sediments) are," Cox said, adding that they've narrowed it down to a billion-year time frame—somewhere between 700 million years old and 1,800 million years old.

"We're fairly sure that these are marine sediments, part of a vanished ocean, that we're looking at here. When were they deposited? Were they deposited near a continent? If so, where was the continent and what kind of continent was it?"

"When you put Africa and India back together again," she



Cox has created a Web site for the "History of Life" course (left). Spike keeps company with Cox and the rest of the Department (right).

added, "there's a gap. And Madagascar fits somewhere in there, but we don't exactly know how. Figuring out what these rocks are and then trying to relate them to their equivalent rocks that must be on mainland Africa will help us narrow that down a bit."

In the two years she spent in South Africa, five months were spent doing the field work in Madagascar.

"Madagascar in general and most of East Africa are not very well understood geologically," Cox said. "One reason is, the geology is very complex; these rocks are very deformed. All of these things have been folded and broken up. A second reason is that there aren't the resources, the education, the training. In these countries, there aren't as many people working on the rocks, so they're not as well studied. We're not going to be able to say next year, 'Yes, this is the definitive answer.' But we're getting more information. People in Africa are getting more information. And, hopefully, we'll eventually converge on a solution."

The researchers use a four-wheel-drive vehicle to help navi-

gate the typically unpaved, ungraded, rut-filled roads. And when that won't work, they travel by foot or even oxdrawn cart.

The time she spent in Africa was exciting and memorable. Cox even attended President Nelson Mandela's inauguration and walked around to various polling stations during the election. "It was a great time to be there," she said. "It was like being present at the birth of a whole new country."

When the postdocs were coming to an end, Cox and her husband decided not to stay in the country beyond that time because "it just wasn't home." From a continental point of view, they wanted to either work in Europe or North America to be closer to family. Cox accepted the position at Illinois, and Brandriss took an offer from the University of Michigan.

"Although they're not in the same place," Cox said of their rationale, "we decided to take them (the positions) because that got us onto the same continent."

The couple see each other every other weekend, and Cox has the added companionship of Spike, the new Geology dog who

has learned the routine, such as where to go for dog biscuit hand-outs, set by her predecessor, Lana. Lana, who was Professor Steve Altaner's faithful friend, became very ill with cancer and died shortly before Christmas last year.

With no husband in town and no television in her home, Cox spends some 12 to 15 hours a day working, mostly on her courses. The fall semester passed at a hectic pace from the time Cox arrived in Urbana-Champaign 10 days before classes started. This semester has the added task of taking a group of students to California for a field trip over Spring Break.

For Cox, though, teaching, particularly the undergraduate-level courses, reminds her of the reasons why she got into geology in the first place.

"The research I do is interesting, but it's basic research," she explained. "It's necessary to increase our body of knowledge about how the Earth got put together, but it's not of immediate benefit to people or society."

"So one of the things that's nice about teaching is that you actually feel like you're doing

something useful. You're passing knowledge on to students and serving a purpose. I'm not just sitting here in an ivory tower getting all wrapped up in a lump of rocks in the middle of Madagascar. I really find it (teaching) rewarding; you get real feedback from students when you see their eyes light up and they say 'Oh, hey, that's pretty cool.'"

One of the projects Cox is working on to continue to pique the interest of her students is the development of a web site for Geology 143 ("History of Life") on the internet. She incorporates e-mail, resources, lecture texts, reading assignments and home pages for herself and the teaching assistants.

"The people who got my interest going as a student were always the ones who were most excited by what they were trying to impart and who seemed to be fired up by the subject," Cox said. "And they got me fired up. I am fundamentally interested in this stuff, so I try to convey that when I'm teaching.

"Especially with (a course) like the 'History of Life'—I mean, these are just mind-boggling concepts. And I try and get a bit of that across. This is amazing stuff, and I want to pass it on because I think you should think it's amazing, too."

This type of academic position, that allows for a lot of teaching as well as research, would be an ideal foundation for Cox's future home base, which she envisions as including her husband, a house, a horse, Spike, of course, and the opportunity to continue her work in Madagascar and elsewhere in the world.

New instructor thrives by teaching undergrads: Eileen Herrstrom

Growing up in the Quad Cities area, Eileen Herrstrom always heard a lot about geology during the family vacations because her father was a geologist. Sometimes she also got to go along on field

trips. But when she went to college, she did not intend to major in the field herself. The first geology course she took at Augustana College in Rock Island was simply to fulfill a science requirement.

Or so she thought.

"I discovered when I did that—hey, this stuff my dad had been talking about all these years was really pretty interesting," Herrstrom said. "And so I ended up as an undergraduate with a double major in geology and mathematics and went on from there."

Where she went, after receiving her bachelor's degree in 1977, was to Stanford University for a master's in earth science. After completing that in 1979, she married

Illinois graduate Dale Herrstrom and spent the next 10 years raising her two daughters and teaching part time in the math and geology departments back at Augustana.

"This stuff my dad had been talking about all these years was really pretty interesting so I ended up as an undergraduate with a double major in geology and mathematics."

tried Illinois graduate Dale Herrstrom and spent the next 10 years raising her two daughters and teaching part time in the math and geology departments back at Augustana.

"When the youngest (daughter) reached first grade, I decided the time was right for me to go back to school and do my Ph.D.," Herrstrom said.

She began commuting back and forth from Rock Island to the University of Iowa in Iowa City. She was also a geology instructor at Black Hawk College in Moline until this past fall when she became the newest permanent addition to the UIUC Geology Department faculty as a teaching laboratory specialist. Herrstrom coordinates the teaching assistant program and teaches undergraduate discussion sections and labs of the introductory courses for majors and non-majors.

Although the work has slowed some, the Ph.D. is down to

the writing of the dissertation, the topic of which is igneous petrology. Herrstrom is looking at the geochemistry of volcanic rocks in Central America and the compositions of the specific elements that are part of the uranium series decay chain.

"You start with uranium—a radioactive element—and it eventually decays down to lead," she explained. "In between, there are a lot of intermediate products with varying half-lives and with different sorts of geochemical behavior. So if you look at the relationships among the different elements within the decay chain, you can say something about what sorts of materials go into making up those lavas and how long it might take between, say, the melting of magma deep beneath the surface and eruption at the surface."

This work has been a good way for Herrstrom to combine her geology and mathematics backgrounds. Plus, she said, "there's just something fascinating about volcanoes."

Although she did go to Costa Rica and Nicaragua in 1992 to collect samples, her research has been primarily lab- and computer-based. Most samples she has analyzed were collected by others and already analyzed for major and trace elements, then she analyzes them for the uranium series elements.

The idea of using uranium series information is relatively recent, she said, and only dates back to the early 1980s. A lot of work had been done on mid-ocean ridges, but extending it to subduction zones was a sort of branching out.

"That's not to say that there wasn't and isn't any information on subduction zone lavas," Herrstrom said. "There certainly is.

mathematical models for fluid dynamics. Those studies suggest the melts move through a network of porous spaces.

"So it essentially would be like squeezing water out of a sponge," she said. "The mantle is under pressure; the melt moves through it. But that seems to me to be, at least, not the total story. It seems to be a process that would take more time than the uranium



Herrstrom uses mineral samples in her classroom to demonstrate physical properties geologists use to classify and identify minerals. For example, pieces of calcite show contrasting crystal and cleavage forms, and specimens of galena and quartz have



But the extensive coverage that I have now in Central America is unusual as far as uranium series data are concerned."

One of Herrstrom's main interests is trying to understand how melts move in the mantle. Most of the work that's been done focuses on mid-ocean ridges and oceanic islands and is based on

series data suggest is actually the case. The data we have from Central America suggest that this entire process is relatively quick—perhaps a matter of 10,000 years from melting deep in the mantle to eruption at the surface. And if that's true, then porous flow is

probably not the entire story because it would take too long. There are other models which involve focusing flow into more porous areas, or variations of that in which melt would actually flow through cracks in the mantle.

"So I'm hoping that I will be able to at least distinguish likelihoods among these various possibilities."

The other major component of Herrstrom's research is understanding the varying mantle compositions along the relatively short area of Central America.

"What it looks like is that we have underneath Nicaragua one kind of mantle that seems to have been affected by subduction for a long time," she said, "and a different mantle composition underneath Costa Rica that seems not to have been affected by that long history of subduction. A single volcanic arc is generally more homogenous than what we found here (in Central America)."

As technical as geochemistry can be for the nonscientist, Herrstrom has a way of explaining her research in easily understandable concepts. That stands her in good stead for her teaching interests, which center around undergraduate instruction.

"What I primarily want to do," she said, "and the reason I accepted this position is to teach and, in particular, to teach undergraduates rather than graduates. I would like also to branch out into

public outreach. It's really a necessary thing to do for a lot of reasons. We have many decisions to make as a society about how to spend a limited amount of funds. And when the question has to do with geological phenomena, then we need to have people who know something about them."

One way she can accomplish this goal is by teaching the non-majors. That's not always a popu-

est by showing her own interest. "In fact, I have a tendency to get excited and start talking too quickly, and I have to stop and slow myself down."

The hectic pace of her first semester at Illinois has caused her to try and allot her time more carefully now. Most of her teaching takes place three days of the week in order to make some time for working on her dissertation.

Realistically, she hopes to be close to the end of it by the end of the semester.

Although her appointment did not include a research requirement, Herrstrom does not want to put research behind her altogether. In fact, while she was surprised to land at a large university, given her strong interest in undergraduate teaching, she has found that the U. of I. can fulfill

her academic goals while offering the added benefit of doing so within a larger research community. "As far as I'm concerned," she said, "it's the best of both worlds."

Her dissertation work is satisfying as well as specialized, but she realizes she can't share such technical and complex work with a wide audience. In teaching undergraduates, she can reach that larger group.

"Besides, there's always the possibility that someone else will follow the same path I did," Herrstrom said and laughed. "They'll register for Geology 100 to fulfill a requirement and think, 'Hey, this stuff is pretty neat,' and we'll end up with another major."

"We have many decisions to make as a society about how to spend a limited amount of funds. And when the question has to do with geological phenomena, then we need to have people who know something about them."

lar assignment for faculty because the students aren't always the most receptive and enthusiastic learners. But Herrstrom adjusts.

"For one thing, you can't be nearly as mathematical with the non-majors," she said. "I think, too, you have to be careful not to use too much jargon."

"Teaching non-majors is kind of like translating some of the more technical language, and you lose something in that. But I think you can gain as well. You lose some precision and accuracy, but you gain in being able to talk to a wider audience."

Part of Herrstrom's teaching approach is to instill student inter-

A variety of geology gets his full attention: Jerry Magloughlin

"I call myself a structural petrologist, actually," said Jerry Magloughlin, a new visiting assistant professor in the Department this academic year. "That's unusual.

summer camp. He remembers taking one of those interest surveys in school, and he rated high in adventure, science and outdoor activities.

"I basically sat back and (asked myself) what career would keep me happy for the rest of my life, hold my interest, allow me to travel and be outdoors and work with people and teach."

Everybody uses other techniques to an extent, but I try to be as broad as possible."

His main interests are structural geology, petrology and geochronology—any one of which would keep a person busy full time. That might explain why Magloughlin jokes that he's always behind in his reading. He really devotes a lot of time to a variety of interests in geology, and he's very driven.

While growing up in Minnesota, he said he never even saw an outcrop until he was about 14 years old and on a trip to Duluth. Yet he's known all along since high school that he was going to be a geologist, and he was fortunate enough that his school offered geology classes and a

"So I basically sat back and (asked myself) what career would keep me happy for the rest of my life, hold my interest, allow me to travel and be outdoors and work with people and teach," he said. "Astronomy was another possibility, but jobs there are few and far between.

"I love the whole field of geology, but when I hit my first class in structural geology, somehow everything clicked. It combined all my interests. I just knew it."

Magloughlin received his bachelor's degree from the University of Minnesota-Duluth in 1983, and a master's from the University of Washington in Seattle in 1986.

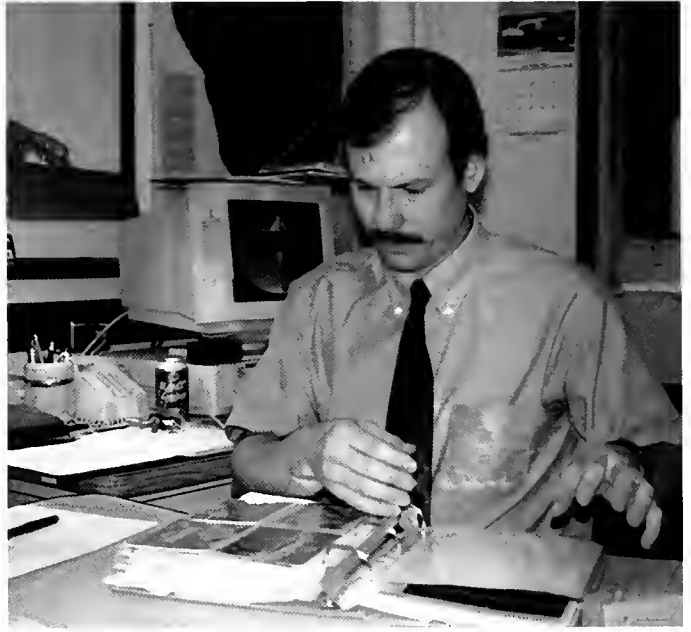
"I didn't have a good feel for graduate-level research at first," he said. "So I felt a little guilty after about a year and I hadn't really gotten very far. Then when I did get going, all of a sudden I just exploded and wrote this huge master's thesis in about a year and a half."

To demonstrate, he pulled the thick volume of his thesis from a crowded shelf in his Department office, and it landed with a thud on his desk.

While in Washington, Magloughlin was struck with the beauty and geologic variety of the Cascade Mountains, and the area became a major site for his subsequent research, including his Ph.D., which he received through the University of Minnesota-Minneapolis in 1993.

"For my Ph.D. I focused on the whole terrane or structural block," he said. "I did a structural and tectonic analysis of the terrane for the first part of my Ph.D., and then a new faculty member, Larry Edwards, showed up and I pitched in with him for the last part of my Ph.D., which ended up taking another two or three years. So I wound up doing a very long Ph.D."

That's understandable considering his research interests: the evolution of mountain belts and high-strain zones in the Earth's crust in the North Cascade Mountains and in the Grenville Province of eastern Canada; mapping, structural geology, metamorphic petrology and geochemistry of metamorphic rocks; plutonic igneous rocks; and ductile and brittle deformed fault rocks.



The dark bands are pseudotachylyte veins, rock that has melted when a fault slips fast enough under the right circumstances. Magloughlin has collected data on numerous samples found within the North Cascades.

His work brought him then to the University of Michigan for a two year stint as a National Science Foundation postdoctoral researcher. His interests expanded even more as he learned how to use several "new, fancy toys." He married wife Linda by this time, as well. When the postdoc was

coming to an end, Magloughlin applied and was invited to the University of Illinois.

"My position here is nice," he said. "I was hired specifically to teach classes. But at the same time, everyone's been very supportive about letting me continue to do my research. I have a lab downstairs. I continue to work up at Michigan a little bit and what-

ever else I want to pursue. I now have a master's student working with me and two undergraduates. So it's been really nice."

The first semester was pretty hectic, too. When he arrived on campus in August, he was in the classroom a week later, then left for a conference he co-organized in September and was gone for a week.

The conference, held in Leavenworth, Washington, and attended by 80 scientists from around the world, was a major undertaking by Magloughlin and two colleagues. It centered around fault zones and was a natural next step following a special issue of *Technophysics* that was published in 1992 called "Frictional Melting

Processes and Products in Geological Materials" by Magloughlin and John Spray from the University of New Brunswick.

Within the North Cascades, Magloughlin said he has found one of the best localities of pseudotachylytes, a rock specifically formed in a fault. Its distribution, size and quality have turned that part of the mountains into a real laboratory for him.

"In fault zones, what we see at the surface where the ground breaks and a house falls into a crack—that's really nothing as far as the significance of the fault is concerned," he said. "That's just a little surface disruption. Where the real action is taking place is usually down a few miles or even 10-15 miles down. That's where rock all of a sudden decides to 'go' because of the stresses that have built up. That's the really exciting location.

"Under the right circumstances, faults will slip fast enough to cause the rock to heat up and melt. The rock that's produced is called pseudotachylyte. It's often well-preserved through long periods of geologic time. And the exciting significance is that it is direct evidence of an ancient earthquake. I like to call it a fossilized earthquake."

Another exciting accomplishment is that Magloughlin has managed to date the rocks accurately using the ^{40}Ar - ^{39}Ar technique, which allows one to work on milligram-scale samples. It is clean and precise and, with a number of corrections, it is possi-

ble to calculate a date.

As a result, he said, "we can show that central Washington was struck by a series of earthquakes around 55 million years ago, not long after the dinosaurs died off. It was a very seismically active area."

But Magloughlin doesn't remain glued to his research. He's very serious about his interest in teaching. Last fall he taught the mineralogy lecture and lab sections. This semester, it's an honors introductory course and, in fulfill-

"I think it's essential to keep going with the research. It keeps you up to date, it keeps you excited about stuff."

ment of a longtime goal, a planetary geology course called "Geology of the Planets."

"We have neat setups here," he said. "I'm impressed by the audio visual setups in the classrooms. For the planetary geology class, for example, I'm bringing in meteorites to show, video discs and slide collections. I'd like to make it very visual. The solar system is a tremendously beautiful place."

Teaching each level of student, from non-majors to majors to graduate students, has its appeal to Magloughlin, but they remain very different. The honors introductory course allows him to

be more rigorous and mathematical. The small, more diverse class has an atmosphere that encourages questions and discussion. "I have great fun with the intro classes, and I like to be very enthusiastic.

"For grad students, you're preparing them for a career," he said. "For majors, it's a little uncertain. About 70 percent of science majors wind up doing something in the science field. For the intro students, it's fun to just expose them to a new area of the world around them."

Magloughlin's world right now mostly comprises work because he enjoys it. He also believes in staying competitive, whether in his research or on a tennis court for fun (he was on the varsity tennis team in college). The biggest problem is having too many things going at

once. Perhaps there is a connection between his chock-full work schedule and the numerous, empty Diet Mountain Dew cans that serve as makeshift shelf supports in his office. But don't look for any paring back soon.

"I think it's essential to keep going with the research," he said. "It keeps you up to date, it keeps you excited about stuff. I think it's harder to be a really enthusiastic instructor and continue to have fun in the field if you don't keep up to date and if you don't have your own interests to pursue."

Following her instincts led the way to geology: Mindy Tidrick

By John Spizzirri



Mindy Tidrick surveying the dead zone atop the research site at Elizabeth Mine, Vermont. Shown during the fall dry season, over one quarter mile square mile of dead landscape covers the surrounding tailings pile. During spring rain events this is an acidic swamp.

In the hands of Walt Disney, Igor Stravinsky's *The Rite of Spring* becomes a wild dance through eons and epochs and eras. It is a movement of stellar assembly and terrestrial upheaval, an ode to birth and death and regeneration.

This particular combination of music and animation creates the evolution scene from Disney's masterpiece, *Fantasia*. With its synchronized volcanic eruptions and final scene of dinosaurs plodding toward extinction, what child would not be moved to wonder and awe?

"I love that scene," says Mindy Tidrick. "It triggered all sorts of science projects throughout elementary school and junior high on rocks, minerals, earth processes and dinosaurs."

Since that imaginative romp through the geologic past, Tidrick has followed a roundabout path that eventually led her to the University of Illinois and toward a master's degree in geochemistry.

Born in southern Indiana, Tidrick's family wound up in Chelsea, Michigan, where she spent most of her childhood years honing her interest in and knowl-

edge of fossils and rocks. But by the time she got to high school, the pursuit of a career in the earth sciences became less enticing as it seemed less viable as a profession.

"I did a report for some speech class or something where you researched a career you were interested in," she recalls. "I looked at paleontologists, and the number hired was in the single or barely double digits, so I was really disappointed. At the time, I didn't think of geology in terms of geochemistry or any of the different applications associated with it."

Tidrick entered the University of Notre Dame as a chemical engineer in 1989, but by the end of her sophomore year had rethought her career direction and found a home in a multidisciplinary major called Pre-professional Science Business. Essentially a hospital administrator's prep program, she was still able to focus on her science interests and transfer her engineering and science credits.

Along with a series of first-year, introductory business courses, she was required to take introductory courses in the major science disciplines—physics, chemistry, etc. Her first semester found her comfortably grounded in the course "Historical Geology."

"I loved it," she exclaims.

In the course of her science studies at Notre Dame, she found an "unofficial mentor" in the figure of Dr. J. Keith Rigby Jr., with whom she took as many classes as possible. Tidrick's dedication to both mentor and study path paid off during her senior year, when Rigby offered her the opportunity to help conduct paleontological research in China.

By January 1993, Tidrick found herself in Guangdong, China's southernmost province, formerly Old Canton Province. There, Rigby was concentrating his research on the Cretaceous-Tertiary (KT) boundary. This was the group's first trip to the region and much of the time was spent building diplomatic and scientific relations.

Chopstick factory tours and diplomatic dinners aside, the group did find an area near the KT boundary known for a set of dinosaur footprints and some egg nests. By the time they left, they estimated that the expanse of footprints was larger than had been expected, reports Tidrick.

They further established that the egg nests were part of a breeding ground for numerous dinosaur species. This area still holds great research possibilities, as do other areas of southern China, she notes. (Researchers working in the Gobi Desert recently made headlines after the remains of a brooding Oviraptor were discovered there, further supporting a dinosaur-bird genealogy.)

Tidrick was engaged to be married during her senior year at Notre Dame and plans for a master's degree were to be placed on hold while she and her fiancé worked to raise money for grad school.

"But that (trip) basically sealed it. I got to see all the different aspects of geology in action. And Dr. Rigby took me by the shoulders, literally shook me and

said, 'You will be an idiot if you don't go to grad school now.'"

Two weeks after returning from China, Tidrick took the GRE on standby, applied late to UIUC and was accepted for the fall semester of 1993. Now finished with her coursework, she is currently working on her thesis.

A low-temperature geochemist, she looks at acid mine drainage and its impact on the environment. Waters that drain

"I love working with people who have a childhood interest in geology. The enthusiasm may be buried, but once that interest is ignited, they're like big, very interested school children and they'll learn."

through old mine shafts or percolate through left over tailings can acidify water, creating an excess of heavy metals like lead and zinc that may eventually end up in water supplies. Water samples taken near the Elizabeth Mine in South Strafford, Vermont, will help Tidrick create a computer model of the chemistry of the acid mine drainage there.

Tidrick has worked as a teaching assistant every year since she arrived at the University, in part to pay for tuition, but it seems equally for the enjoyment she gets out of it. Most recently, she helped teach an introductory hydrogeology course.

"I had fun introducing that to a lot of people. I like the application of science, and that's why I like teaching," says Tidrick.

"I like teaching people what geologists and other scientists do and also how they can apply it. And I love working with people who have a childhood interest in geology. The enthusiasm may be buried, but once that interest is ignited, they're like big, very interested school children and they'll learn.

"But if you do it wrong, you totally lose the whole group," she warns. "It's like a one-room schoolhouse. You have engineers who are in their senior year, itching to get out, but they want to take this intro to geology course so they'll understand the geo terminology. Then you have the first-year freshmen who are taking this

course just because they like looking at rocks. There's such a dichotomy of skills in the classroom that it makes teaching a real challenge and makes it fun."

Apparently, her enthusiasm is catchy. This past spring Tidrick received the Department's Outstanding Teaching Assistant Award, and she is currently a Geology Department candidate for the Luckman Award, annually presented to only 10 teaching assistants across the campus. The Department has a very good run for the Luckman, she says. The last two nominees have won the award.

Alumni News

Obituaries

Robert H. Kennedy, B.S. '41, died August 16, 1995, at the age of 79. He is survived by his wife, Arlene, of Ogden Dunes, Indiana.

Dorothy J. Gore, M.S. '52, of Fort Worth, Texas, died August 5, 1994.

Jurg W. Meyer, Ph.D. '58, died July 21, 1995.

Robert N. Farvolden, Ph.D. '63, former Department faculty member, died September 13, 1995. He was Canada's first professor of hydrogeology at the University of Western Ontario. He was former chair of the Department of Earth Sciences and former dean of the Faculty of Science at the University of Waterloo in Ontario, where he also established the first major program of teaching and groundwater research in

Canada. Farvolden was a consultant to governments in Central and South America and Asia. At the time of his death, he was professor emeritus and a member of the Atomic Energy Control Board of Canada. He recently had received the first President's Award from the International Association of Hydrogeologists.

Donations may be made to the R.N. Farvolden Scholarship for Graduate Students, c/o Alumni Office, South Campus Hall, University of Waterloo, Waterloo, Ontario, N2L 3G1, or through the Thomas Funeral Home, 244 Victoria St., E., P.O. Box 309, Alliston, Ontario, L9R 1V6, to a fund which will be donated to The Tree of Life at the London Regional Cancer Clinic, in the family's name.

Richard M. Winar, B.S. '53, M.S. '55, is the environmental concerns coordinator for the Oakland County (Michigan) Road Commission. He enjoys his public service position and also does internal consulting on geology, hydrogeology and environmental concerns. He and wife Lois recently celebrated 43 years of marriage. They live in Waterford, Michigan.

Frank Andrews, B.S. '55, retired in May 1995 from the Florida Department of Environmental Protection after 24 years. He lives in Tallahassee and raises, trains and shows Golden Retrievers. He welcomes correspondence from old friends who may call him at 904/877-4817 or e-mail to FA1234@freenet.fsu.edu or Frank9701@aol.com.

Carl G. Davis, B.S. '59, is an instructor of earth science, physical geology and physical science at Danville Area Community College (DACC). At 73, he continues to enjoy his teaching. Three years ago, he wrote a survey of Vermilion County geology as a sabbatical leave project. It was printed at DACC and distributed to local libraries. He credits the assistance of Hilt Johnson and John Kempton.

Bruce F. Bohor, Ph.D. '59, of Golden, Colorado, retired from the U.S. Geological Survey in January 1995 but still works out of his same office, doing research—"just not getting paid for it." He is now scientist emeritus and received two years of Pecora Fellowship funding.

Thirties

Dalias A. Peice, A.B. '37, M.A. '38, who retired in 1980 after 43 years of teaching, continues her research and writing. She is the official weather observer for the National Weather Service in her hometown of Charleston, and she often gives lectures about weather subjects and the Amish community in Arthur, of which she has studied since 1939.

Forties

Ed Bushman, B.S. '41, and his wife, Louise, of Laguna Beach, California, celebrated their 50th wedding anniversary on December 30 with the help of their six children, Bruce, Gary, Joan, Karen, Mary and Paul.

Fifties

Howard R. Cramer, B.S. '49, M.S. '50, retired in 1987 from Emory University and is now a consultant in Atlanta, Georgia.

Sixties

Mike Lukert, B.S. '60, is a professor in the Department of Geosciences at Edinboro University of Pennsylvania and teaches physical geology, optical mineralogy and petrology. He and wife Emmalou spent a night in Sheridan, Wyoming, last summer.

Bill F. Ripley, B.S. '60, works for The Environment Company in Oklahoma City, Oklahoma, doing assessment and remediation of UST releases and Phase I, II and III site assessments. He worked as a petroleum geologist for more than 30 years at Exxon & Humble Oil, Arnold Petroleum, J.M. Huber Corp. and as a consultant. He has returned to school, attending Oklahoma State night courses in hydrogeology, geochemistry and government regulations.

Donald R. Williams, M.S. '62, retired in December after 33 years in the oil and gas exploration business. Most recently he was senior exploration geologist for Kerr-McGee Corporation in Oklahoma City, Oklahoma, primarily engaged in deep gas exploration projects in the U.S. Onshore Region. He plans to continue with and upgrade his cattle ranching enterprise.

"I was in the Kerr-McGee Tower on April 19 during the tragic bombing of the Federal Build-

ing in OKC," he writes. "Our building, two blocks southeast of the blast site, had 92 windows blown out. However, only 19 employees suffered minor injuries from flying glass. The emotional scars will last much longer."

Frederick D. Busche, B.S. '65, has joined the faculty of East Central University in Ada, Oklahoma, as assistant professor and chair of the Department of Cartography and Geography. He previously was division manager of soil and groundwater programs for Man-Tech Environmental Technology Inc. at the Robert S. Kerr Environmental Research Laboratory in Ada.

Glenda Sue (Wilborn) Cordon, B.S. '65, is dean of admission and financial aid at McKendree College in Lebanon, Illinois. She is responsible for the recruitment operation of the college, in addition to running the financial aid office.

Jim Lacey, Ph.D. '67, is affiliated with the Geochemistry Section of the Geotechnology Research Institute, which is one of the groups composing the Houston Advanced Research Center (HARC) in The Woodlands, Texas. He retired in October 1995 after 28 years with Texaco and joined the HARC to help establish the Alliance for Geochemical Research.

Seventies

Suzanne M. Kay, B.S. '69, M.S. '72, was named science editor for *GSA Today*. She handles review and disposition of solicited or volunteered science articles and book reviews for the publication. She is an associate professor in the Department of Geological Sciences at Cornell University in Ithaca, New York.

John C. Steinmetz, B.S. '69, M.S. '75, has accepted a position at the Montana Bureau of Mines and Geology as director and state geologist. The bureau is essentially Montana's geological survey.

Nahum Schneidermann, Ph.D. '72, is director of international technical relations, executive staff, for Chevron Overseas Petroleum Inc. in San Ramon, California. In the October 1995 issue of *AAPG Explorer*, he was featured as a candidate for vice president of AAPG.

William I. Ausich, B.S. '74, was recently appointed chair of the Department of Geological Sciences at The Ohio State University.

Susan (Wintch) Wunder, M.S. '74, is a self-employed dairy farmer in Bloomington, Indiana, with her partner-companion, Charlie, and 9-year-old son, Tim. She continues to do technical editing for various government agencies "in between milkings." The farm was featured in a photo exhibit at Chicago's Peace Museum in 1995.

Mike Hansen, Ph.D. '75, was president of the Nevada Petroleum Society for 1995. He was instrumental in arranging Professor Emeritus Ralph Langenheim's lecture about the history of geologic mapping in Nevada for the

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Yours news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

The class notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

society. He currently operates a consulting business called Eureka Geological Services in Reno, Nevada.

Jim Castle, Ph.D. '78, is an assistant professor in the Department of Geological Sciences at Clemson University in South Carolina. He teaches sedimentary petrology, structural geology and is involved in the hydrogeology graduate program.

Eighties

Jila Banaee, M.S. '81, M.S. '93 (Civil Eng.), is a senior environmental engineer in the Chemical and Environmental Engineering Department of Lockheed Martin Idaho Technologies, which manages the Idaho National Engineering Laboratory, in Idaho Falls. She was been involved with the preparation of technical environmental reports, papers and proposals in the areas of pollution prevention, waste management, waste treatment and subsurface migration of radionuclides.

Her husband received his Ph.D. from Illinois and taught on the Urbana campus for eight years. He now works as an advisory engineer with Lockheed. Their daughter is now 13 years old. "I lived with my family in Urbana for about 14 years," Banaee writes. "It was hard to leave Illinois and friends behind to come to Idaho."

Paul V. Heinrich, M.S. '82, is a research geologist at the Louisiana Geological Survey. He is currently part of a team that is mapping the geology of the state at an intermediate scale. He is also involved in other studies, such as the geoarcheology of sites in southern Louisiana, the mapping of fault-line scarps, and coastal sand ridges.

The U. of I. Geology Department's own Professor **Craig Bethke**, Ph.D., '85, and his wife, Abigail, welcomed the birth of their daughter, Gabrielle McKay, on Oct. 18, 1995. She weighed in at 9 pounds, 11 ounces and was 20.5 inches.

Yong Il Lee, Ph.D. '85, was promoted to professor of sedimentology at Seoul National University and is serving a two-year term as chair of the geology department there. He recently completed a year's sabbatical research leave sponsored by the Korean government at the University of California at Santa Barbara. Lee's adviser was George D. Klein.

Navy Lt. Thomas R. McCook, B.S. '85, completed a six month deployment to the Persian Gulf last year with the guided missile frigate U.S.S. Reid. The ship was operating in support of international sanctions against Iraq. During the deployment, he visited Hawaii, Singapore, Thailand and Sri Lanka. He joined the Navy in August 1985. **Mark P. Fischer**, B.S. '87, and his wife, **Tamara Webb Fischer**, B.S.W. '87 (Social Work), have a daughter, **Kiah Amara**, who was born in December 1991. Several of her relatives are also U. of I. alumni. The Fischers live in Houston, Texas.

Kyung Shik Woo, Ph.D. '86, is associate professor of geology at Kangweon National University in ChunCheon, Korea. Woo is also

spending this year as a part-time visiting professor of oceanography at Seoul National University. He presented a paper and chaired the opening session of the Third Asian Marine Geology Conference in Cheju-DO, Korea, in October 1995. Woo's advisers were Phillip A. Sandberg and Thomas F. Anderson.

James S. Klima, B.S. '88, has left Conoco Inc. in Corpus Christi, Texas, after five years as a geophysicist. Last fall he began work on a master's in geological engineering at the University of Wisconsin-Madison.

Nineties

Laura Becker, B.S. '94, works for HRI, Inc. (Wadsworth Center for Laboratories and Research), analyzing lead levels in blood by atomic absorption. The samples were received from county health departments across New York state. The project is part of a New York State Department of Health study to monitor lead in children.

Dan Nolan, B.S. '95, is recovering from injuries he received in a November 1995 accident in Denver, Colorado. He has since been transferred to Chicago Rehabilitation Institute and is undergoing rehabilitation therapy. His parents welcome any visits or letters. His address is Chicago Rehabilitation Institute, 345 E. Superior, Rm. 410, Chicago, IL 60611.

REMINDER

You can send your update for the
Alumni News section
via e-mail: geology@uiuc.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; **e-mail** geology@uiuc.edu.

Name _____

Response date _____

Home address _____
(indicate if changed)

Office address _____

Home phone _____

Office phone _____

E-mail _____

Degrees from Illinois (with year) _____

Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
Stamp
Here

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1301 West Green Street
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GeoSciences

Department of Geology Alumni Newsletter

Fall 1996



About Our Cover:

Lava streams, capable of rushing down steep slopes at rates of 60 kph, are formed when lava falls from fountains and flows from vents. This particular lava stream formed during an eruption at Mauna Loa, and the image is one of the many spectacular sites students are able to visit when exploring the virtual field trips created by Stephen Hurst.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and winter of each year.

Staff Department Head: R. James Kirkpatrick; Assistant to the Head: Peter A. Michalove; Editor: Susan Sheridan; Production: LAS Office of Publications; Administrative Secretary: Terri George.

From the Department Head



Dear Fellow Alumni,


As is usual at the start of a new academic year, there are many changes and new faces in the Department. We especially want to welcome Steve Hurst, our new computer systems manager and educational software developer, and Peter Burns and Eric Bestland, who are new visiting assistant professors. Steve has a background in research and education in geoscience as well as computer technology. Technology-based education is rapidly becoming the norm, and Steve is helping us move rapidly in that direction. There is a profile of him in this issue. Peter is a mineralogist and has worked on uranium minerals, among other things. Eric is a sedimentologist and has worked for several years on interior basins. Profiles of them will appear in the winter issue of GeoScience.

As many of you are aware, Bill Shilts became the new chief of the Illinois State Geological Survey last year, and fortunately for us is also an adjunct professor. Bill is a quaternary geologist and this fall semester will be teaching a seminar on "Environmental Applications of Surficial Geology" for graduate students and upper level undergraduates. We look forward to this course in particular and to continued strong interaction between the ISGS and the Department in general.

I also want to take this opportunity to let you know about new programs some of your fellow alumni are undertaking to provide much needed support to the Department, and to thank those involved in the efforts. A group of Midwest alumni with Brud Leighton and Haydn Murray as co-chairs and Park Livingston and Jack Simon as honorary co-chairs is working to develop a \$100,000 endowment for undergraduate research scholarships. The kick-off for this program was on September 21 in Urbana, and it will extend throughout the fall and winter. A group of Oklahoma and Kansas alumni led by Les Clutter are undertaking a similar program to provide a \$50,000 endowment to support student field trips, and the kick-off for this program will be October 24 in Tulsa. Both are modeled after the highly successful effort of the Texas and Louisiana alumni group which is raising \$300,000 for a graduate fellowship. I am very excited about the two new programs because I remember well how important both field trips and research opportunities were to me as a student, and I have seen from the faculty side how much they help students grow.

Please remember to drop by the Department if you are in the area.

Best Regards,


R. James Kirkpatrick
Department Head

New Fundraising Effort to Support Undergraduate Scholarships



A Midwest fundraising effort got under way September 21, 1996. Attendees were taken on a tour of the Department of Geology, treated to lunch, and invited to attend the Illinois vs. Akron football game that afternoon. The goal of the development project is to raise \$100,000 for an

endowment which will provide a permanent stream of interest to fund undergraduate research scholarships.

Morris W. Leighton, B.S. '47, and Haydn H. Murray, B.S. '48, M.S. '50, and Ph.D. '51, co-chair the committee overseeing the development project. Leighton is a retired chief of the Illinois State Geological Society and chairman of the Department's GeoThrust committee. Murray is professor emeritus at Indiana University.

Honorary co-chairs for the committee are Park Livingston, B.S. '30, and Jack Simon, A.B. '41, M.S. '46. Livingston served ten years on the University of Illinois Board of Trustees, and is president emeritus of the board. Simon is a retired chief of the Illinois State Geological Society and the first recipient of the Department's alumni achievement award.

Potential Baraboo Reunion

Members of the 1950 Baraboo field camp experience who are interested in participating in a reunion should contact Richard M. Winar, 2705 Beacon Hill Drive, Apt. 209, Auburn Hills, MI, 48326-3755. Winar may also be reached via email at mnm47a@prodigy.com.

Students Reap Awards

Faculty, staff, and students all gathered at Yen Ching restaurant in Urbana on May 1, 1996, for the annual Department of Geology awards banquet. The following students received awards:

Morris M. And Ada B. Leighton Memorial Award:

Amy C. Berger
Melinda R. Tidrick

Estwing Pick Award:

Catherine A. Hier

Outstanding Teaching Assistant Award:

Melinda R. Tidrick, Fall 1995
Sally E. Greenberg, Spring 1996

Alumni Outstanding Senior Award:

Theresa L. Croak
Nathaniel P. Stephens

Outstanding Woman Graduate Award:

Sally Greenberg

Department Thesis Support Grant:

Judy Becker
Christine Gerdon
Steve Schrimmich

Degrees Conferred by the Department of Geology

October 1995

Yeongkyoo Kim, Ph.D.

January 1996

Daniel Christopher Barnstable, B.S.

Scott Randell Ellis, B.S.

Ayoola O. Folarin, B.S.

David Aaron Grimley, Ph.D.

Christopher Paul Korose, B.S.

James Blake Snodsmith, B.S.

Steven Daniel Sroka, Ph.D.

May 1996

Edward James Burns, B.S.

Jeanne Marie Burns, B.S.

Theresa Lynn Croak, B.S.

Christie Marie Demosthenous, M.S.

Allison Ann Flowers, B.S.

Theresa Lynn Beckman Fritzel, M.S.

Matthew Patrick Haverty, B.S.

Stanislav Valentinovich

Sinogeikin, M.S.

Nathaniel Patrick Stephens, B.S.

Magna Cum Laude

Meggan Kathleen Weeks, B.S.

August 1996

John Jeffrey Anglen, B.S.

Anne Marie Estandarte, B.S.

Scott Aaron Stawarz, B.S.

Jianzhong Xu, M.S.

From the Department's Archives

Below: Hilt Johnson with Dean Bob Rogers, and Rogers' son at Sheridan field camp, 1965.

Right: Don Henderson doing field work in Dubuque, Iowa, 1948.



Newsletter Photo Request

Don Henderson has a damaged 8 x 10 photo of the faculty, staff, and graduate students of the Department in 1952. The picture is in such poor condition that it won't reproduce for the newsletter. If any readers have a good copy of the photo, or information to identify some of the people in it, Henderson asks that they write him at the Department address or call him at (217) 367-9975.

Check It Out!

<http://www.geology.uiuc.edu/>

Geology Alumni Serve on GSA Committees

The following alumni of the Department of Geology are currently serving on GSA committees:

Committee on Investments:

F. Michael Wahl

Committee on Membership:

John D. Kiefer

Committee on Nominations:

Sharon Mosher

Committee on the Penrose

Medal Award:

Donald R. Lowe

Program Committee:

John A. Cherry

Committee on Publications:

Keros Cartwright

John M. Sharp, Jr.

Bruce F. Molnia

Suzanne Kay

Committee on the Young Scientist Award:

Mark Cloos

Ad Hoc Committee to Study GSA Committees:

Sharon Mosher

Ad Hoc Committee on Annual Meeting Programs:

Sharon Mosher

Ad Hoc Committee on Publications:

Keros Cartwright

John M. Sharp, Jr.

Profiles

Outstanding Alumnus: Kenneth O. Emery

"Somebody asked me once, 'What's the basis of my being elected to the National Academy of Science?' To them it seems as if I'd spread myself out to so many different subjects and I'm supposed to be a specialist. I guess I like to work on things I'm interested in."

And his interests range wide.

Kenneth O. Emery (B.S. '35, Ph.D. '41), received the 1996 Geology Alumni Achievement Award. Intended to recognize outstanding achievement in the field of geology, the Alumni Achievement Award was established in 1994 and has been awarded annually as the Department's highest honor. Emery was nominated by the Department's Advisory Committee and the GeoThrust Committee for his pioneering work in oceanography, a field that had its infancy here at the University in the 1930s.

But while technically a specialist in sedimentation, Emery has never been one to limit his research to one narrow aspect of the discipline. Over the course of his lifetime he has traveled the globe and studied atomic radiation, barrier reefs, continental bottom sediments, and atoll formation—to name just a fraction of his research areas.

Born in Canada in 1914 and raised in Texas, as a boy Emery

attended the public schools in the Dallas/Fort Worth area. "I collected fossils from the Cretaceous period, too," he recalls, "so I knew something about the geology around my home."



Kenneth O. Emery received the 1996 Outstanding Alumni Achievement Award.

A stint in junior college revealed an aptitude for physics and calculus, and for a while, Emery thought he might pursue electrical engineering. "Just for fun I took a course in geology too, and liked it. One of my professors convinced me to combine my interests in both engineering and geology into mining engineering," says Emery.

That same professor also recommended to Emery that he pursue his interest at the University of Illinois. And in 1936, aboard a freight train, Emery arrived.

"In the thirties there were lots of people riding freight trains," recalls Emery. "We'd get prepared as the freight train was starting, then we'd hop aboard once the train was still going slow enough so we could get aboard yet fast enough to evade the yard cops. That was the method of transport in those days."

Once settled at the University, Emery found two jobs: one fed him, one paid him. "I waited tables for the food, and drafted for Professor Shepard for the money. At thirty-five cents per hour, by the way."

Francis Shepard, considered by many to be the father of marine geology, would have a profound influence on the young Emery. When Emery became disillusioned with the program in mining engineering which concentrated solely on issues related to mining coal, it was Shepard who encouraged him to consider changing his major to geology.

Summer work at the Coast and Geodetic Survey in Washington, D.C. and on cruises at the Scripps Institution of Oceanography influenced him further to concentrate on marine geology. So it was that he completed a master's thesis on the mechanics of sediment coring and, in 1941, a



Emery Links Oceanography and Coins

True to his desire to study geology from every angle, Kenneth O. Emery is currently working on his sixteenth book, tentatively titled *Oceanography Illustrated by Coins*.

"Many countries and civilizations—the Phoenicians, Greeks, and Romans included—published coins with marine motifs on them.

"For example," says Emery, "Benjamin Franklin is on one of the U.S. half dollars. Well, Franklin had been post postmaster for some time and was concerned with why it took two days longer for the mail to come from London to New York than it took for mail to go from New York to London. In studying the problem, he discovered the phenomenon of the Gulf Stream."

Emery continues, "Franklin was also ambassador to France, and on several trips he brought along a thermometer to measure the temperature of the water en route to locate to path of the Gulf Stream."

So far, Emery has amassed and photographed about two thousand coins and is currently sorting the images into categories. Each photo will be accompanied by an explication of the motif.

Coins courtesy of the World Heritage Museum

doctoral dissertation on the lithology of the sea floor off southern California.

The post-Depression era was a difficult time for marine geologists to find work in their field, however, so for a while, Emery worked as a staff member of the Illinois State Geological Survey. He used his background in engineering to search for municipal and industrial supplies of ground water.

An opportunity to work in his chosen field came knocking in 1943 when he rejoined Shepard as a marine geologist. Together they helped the war effort by addressing problems of the ocean associated with pro- and anti-submarine tactics.

Shepard and Emery made bottom sediment maps for the regions in which the United States and Japan were engaged in battle. U.S. submarine captains used the maps to outwit Japanese destroyers; U.S. destroyer captains used the maps to locate Japanese submarines.

"Where there was mud bottom, the sound waves were absorbed; if it was a sandy bottom, the sound would bounce off the bottom and have a pretty long range, say 3000 yards," explains Emery. "The Japanese destroyers could find our subs better that way, so our submarines tried to stay off the sand bottom. On the other hand, if the bottom was rocky, there was a lot of reverberation and the destroyers couldn't pick out the right echo.

"I ran across a destroyer captain recently at a dinner I attended, and he knew about the maps," says Emery, obviously pleased. "In other words, they were used."

After the war, Emery took a post as an assistant professor in the geology department at the University of Southern California at Los Angeles. During the course of his tenure there, in addition to teaching a full course load, Emery spent several summers working with the U.S. Navy and the U.S. Geological Survey.

In 1946 he went to Bikini to study the hole made by the first and second atomic bombs and to determine the spread of the resultant radioactivity. In 1948 he traveled to the Persian Gulf to gather general information about the area, which was not widely available at that time. In 1950 he returned to Bikini, and 1952 found Emery in Guam where he was attempting to confirm Darwin's theory on reef sequence formation (earning him, incidentally, the nickname "Mr. Darwin" among his colleagues). In 1954 Emery's interest in beachrock took him to Hawaii to study the calcium carbonate-rich sand there and the process by which it became cemented into rock.

Emery also spent considerable time during this period aboard the U.S.C. ship R/V *Velero* investigating the southern California and Mexican borderland and aiding students in their graduate work. The latter half of 1958 was spent summarizing the knowledge about the borderland in a book, *The Sea Off Southern California: A Modern Habitat of Petroleum*.

But when it came time to

proofread the manuscript for that book in 1959, Emery was in Israel as a Guggenheim Fellow, studying the manner of deposition of salts in the Dead Sea.

By this time, Emery had reached the rank of professor, "and with no urgent funding

Over the course of his lifetime
Emery has traveled the globe and
studied atomic radiation, barrier
reefs, continental bottom
sediments, and atoll formation—
to name just a fraction
of his research areas.

problems I decided to change from the Pacific to the Atlantic ocean, from teaching to straight research, and from chiefly sedimentation to chiefly geophysics," says Emery. "I decided it was time to learn something different."

In June 1962 Emery joined the Woods Hole Oceanographic Institution where one of his first responsibilities was the study of the entire Atlantic continental margin between Labrador and Mexico. Undertaken in conjunction with the U.S. Geological Survey, this intense effort ended in 1967 with the establishment of a Marine Branch of the USGS.

After a year as the first dean of the WHOI graduate school, Emery returned to shipboard studies with the aid of the U.S.

Navy and as the U.S. representative to the United Nations Economic Commission for Asia and the Far East and its Committee for Coordination of Offshore Prospecting.

When Emery retired as the Henry Bigelow Oceanography Chair at WHOI in 1979, he retired

in name only. From then until now, he has been conducting research and publishing books and articles as steadily as ever.

- The Geology of the Atlantic Ocean, written with a colleague and former student, Dr. Elazar Uchupi of WHOI.
- A book to update the usual primitive treatment of the origin of the earth and its relationship to other planets appeared as

Morphology of the Rocky Members of the Solar System.

- Studies attempting to explain the apparent rise of sea levels caused by the vertical movements of land were combined and augmented in a book with Dr. D.G. Aubrey, also of WHOI, *Sea Levels, Land Levels, and Tide Gauges*.

When asked what Emery would have done had he not become a marine geologist, he replies, "I probably would have been an electrical engineer, or an archaeologist."

But he is not sorry geology stole his heart. Looking back on his career, he is satisfied with what he has accomplished. "My only regret is that I won't live long enough to explore it all."

Virtual Field Trips a Reality: Stephen Hurst

In April 1996 the Department of Geology welcomed Stephen Hurst as its newest staff member. Hurst had previously been on the faculty at Duke University since 1990.

While at Duke, Hurst was instrumental in developing a series of computerized field trips, giving users the chance to "visit" geologically significant sites electronically. He brings this technology to the University with hopes that such so-called "virtual field trips" will become an

integral part of the geology curriculum.

But let's start at the beginning.

"I was born in Nuremberg, Germany," says Hurst, "but I don't remember a thing about it because shortly thereafter my family moved to Peoria. My dad worked at Caterpillar, just like everyone else's dad in Peoria."

Did he have any inkling that geology was in his future? Hurst says no. "I did like to collect rocks as a kid, but I didn't know anything about them. I was

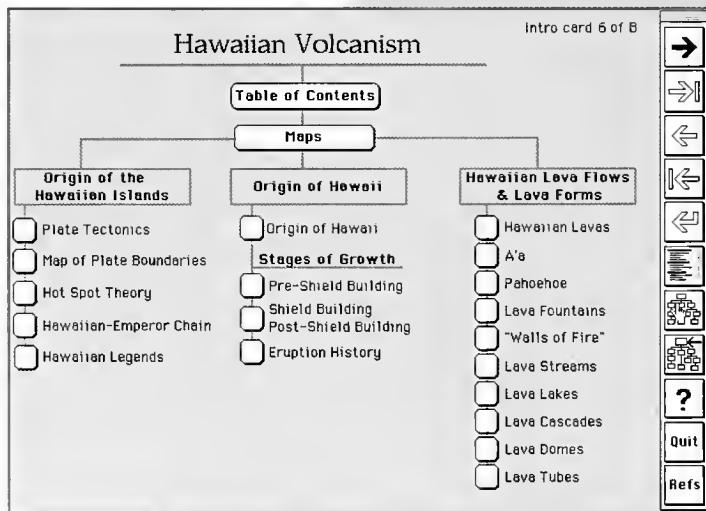
always scientifically minded, though, and knew that the natural world was what I was interested in."

A temporary relocation to Oak Park meant that Hurst attended Oak Park-River Forest High School.

"Oak Park-River Forest was an excellent high school. It changed my horizons a lot," Hurst recalls. "That school had nice facilities, nice capabilities, very good teachers."

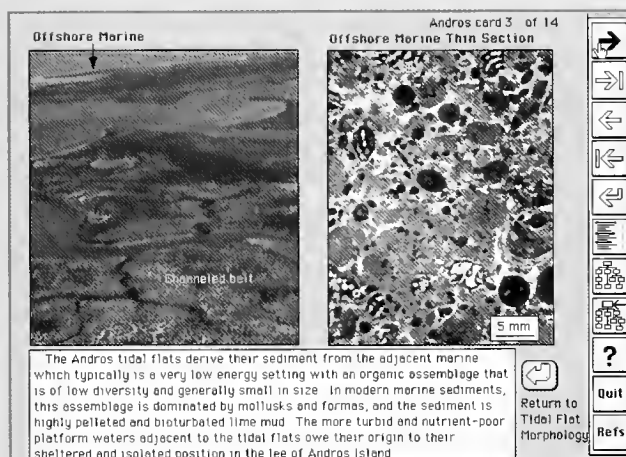
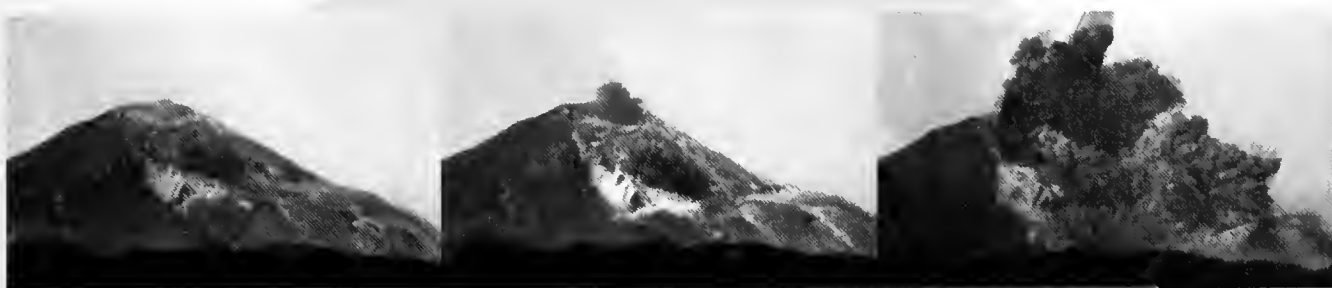
A chemistry scholarship brought Hurst to the California Institute of Technology in 1973. He credits Cal Tech for providing him with a solid background for future work in scientific fields.

"When I was a student at Cal Tech, there were really no such



Stephen Hurst (below) creates virtual field trips that enable students to visit geologically significant sites electronically. For instance, students wanting to explore volcanism may begin at this point (left), where topics of interest are outlined and accessed by the click of a button.





Some of the field trips contain short movies (top) that show geological phenomena in action. This series of images is taken from a movie which shows the dramatic eruption of Mount Saint Helens in 1980. Students are able to visit sites on many different scales as illustrated above. On the left is an aerial view of the Andros tidal flats. On the right is a thin section of the offshore marine sediment.

A sampling of field trip sites include:

- the Mid-Atlantic Ridge to explore the types of extension common to the region, along with an examination of volcanism and rock types;
- the Richmond Basin to search for vertebrate fossils of previously unknown Tetrapods;
- South Florida, Florida Bay and the reef tract to gather information on the organisms and associated sediment types;
- Oman and Cyprus to investigate the ophiolites present on a number of different scales;
- Yellowstone National Park;
- the Barrier Islands of Cape Lookout, NC, to explore the barrier island environment;
- Long Valley Calder, CA, to determine the geothermal potential of the area.

thing as majors. You received a general bachelor's of science degree," explains Hurst. "As a result I learned a lot about a lot of different subjects, and that background has served me very well over the years."

When, later, he was to work for Conoco, Inc., as a geologist, one of his first assignments there was to build a laser probe.

"For that I had to learn about ultra high vacuum systems, lasers,

optics, isotope fractionation, mass spectrometers," says Hurst. "All stuff that requires freshman and sophomore level physics and calculus. It all comes back to what I learned during those years at Cal Tech."

From Cal Tech, Hurst went on to earn a master's degree in inorganic chemistry from University of North Carolina. But about half way through that experience he had a change of

heart. "I realized that I didn't want to be cooped up in a lab smelling fumes for the rest of my life, and that what I liked to do was to go backpacking and camping and things like that, so I thought maybe I'd switch to geology."

Upon completing his master's degree in inorganic chemistry in 1979, he applied and was accepted to UNC's graduate program in geology. In 1981 Hurst earned a

master's degree in isotope geochemistry.

"For the next three years, I worked for Conoco, Inc., in Ponca City, Oklahoma," says Hurst. "At the time, that was their research and development location. I was there doing mainly isotope geochemistry and geochemistry."

The decision to pursue his Ph.D. in structural geology at the University of California at Davis ended his tenure at Conoco. Post doctoral studies took him to Duke in 1990, where he also accepted a position as research assistant professor.

A faculty member at Duke first had proposed the idea of the virtual field trips before Hurst was even on the scene. But the initial proposal was for millions of dollars, to be spent on development of the idea and new equipment, and was rejected.

"I came to Duke a few months or maybe a year after it got shot down and realized that I could do 95% of the job a lot cheaper with existing materials and offered to work up a prototype. It took me about a week. I showed it to them, and they were very enthusiastic," Hurst recalls.

A more modest grant proposal was subsequently funded by the Department of Education, and what emerged was a CD ROM with eighteen virtual field trips.

The field trips are easily navigated. Users click on photos,

buttons, or text to access information that comes in all forms, from video sequences to animated graphics to text. Students are often given the capability of viewing complexes on several different scales ranging from satellite views to thin section. At the end of some field trips students are able to test what they've learned with a short quiz. If they feel the need to review something, the appropriate

We're working on a simulation where the student would control the amount of water in a system, the amount of heat coming from hot rock below, and the permeability of the rock. They would then try to simulate either a geyser, a hot spring, or a fumarole.

section of the trip is only the click of a button away.

"I don't see these as substituting for lectures, or real field trips, or even lab exercises where you handle real rocks, do real experiments," assures Hurst. "The idea of the virtual field trip is that you put everything in context. So if students are learning about hydrology, they're going to do what they would anyway in the lab, then they'll go to the field trip and see it in the context of, say, Yellowstone.

"We're working on a simulation where the student

would control the amount of water in a system, the amount of heat coming from hot rock below, and the permeability of the rock. They would then try to simulate either a geyser, a hot spring, or a fumarole."

Students derive some distinct benefits from having this information at their fingertips. First, it allows them to see sites that would be extremely difficult or expensive to access. Second, by doing a virtual analysis of the site, students can get results much more quickly. "On a real field trip where samples are taken and then analyzed, it takes weeks to get results," explains Hurst. "On the computer, the analysis takes minutes."

Initially, Hurst hoped that the virtual trips could be modified or added to by other people. While he still thinks this is a good idea, it's not practical, he says, "because to make them useful for professors, the trips need to be accompanied by workbooks, exercises, a set of instructions. These trips don't come with that."

Ultimately, Hurst hopes to develop the project to the point where it becomes truly interactive for the student. "I'd like the student to be able to ask questions, refine data, manipulate it, form a hypothesis, test it, simulate something real or close to something real and decide whether it works or not."

Uncovering the Earth's Mantle: Stanislav Sinogeikin



Stanislav Sinogeikin

Like many geologists, Stanislav Sinogeikin's interest in the subject began when he was a young boy. While collecting minerals and rocks around his native Moscow and all over Russia, Sinogeikin taught himself to identify and classify them.

It was while a student at a high school that Sinogeikin started to seriously study geology at the Geology School for high school students affiliated with Moscow State University. He went on to pursue his degree in petrology and geochemistry at Moscow State University.

Sinogeikin considers the education he received in Russia to

be very good and comprehensive. "When I was studying geology, I had to learn a lot from different geological sciences," he says.

"Over here students have a choice about which classes to take. In Russia the educational system is (was) a little bit different. I had five years to earn a degree and I didn't choose what I was going to learn, what courses I had to take, except that all these courses were prepared for geochemistry and petrology majors. There was a schedule to follow for each semester. It was beneficial for me to take all of these courses because I have a broader scope of knowledge that surrounds my narrow field."

While working as a research assistant in the Institute of Experimental Mineralogy in Russia, Sinogeikin was given an opportunity to pursue his doctorate here under the guidance of Professor Jay Bass. For various personal and professional reasons, he decided to accept the challenge.

"I wanted to stay in science, but it was pretty difficult in terms of money. Things seem to be getting better in Russia now, but at that time my salary just was not enough to feed my wife and 2-year-old daughter, despite the fact that I had my own apartment and did not have to pay rent. I did not die from hunger, but I had to spend a lot of nights translating commercial papers to and from English, or programming just for some extra money. Over here I am not a millionaire either, but at least I can spend all my time doing my job," says Sinogeikin.

In June 1994 Sinogeikin arrived on campus. He is currently working on the problem of the mineralogy of the Earth's mantle. "This is not exactly mineralogy because we are working mostly with synthetic high-pressure mineral phases. We start with physical properties of minerals—sound velocities, and compressibilities, for example—and are trying to apply them to geophysics to construct Earth's models," says Sinogeikin. "What we are doing is called mineral physics."

The challenge lies in trying to construct a model of something that cannot be observed directly. The thickness of the Earth's crust in regions where people can drill deep wells varies from 30 to 50

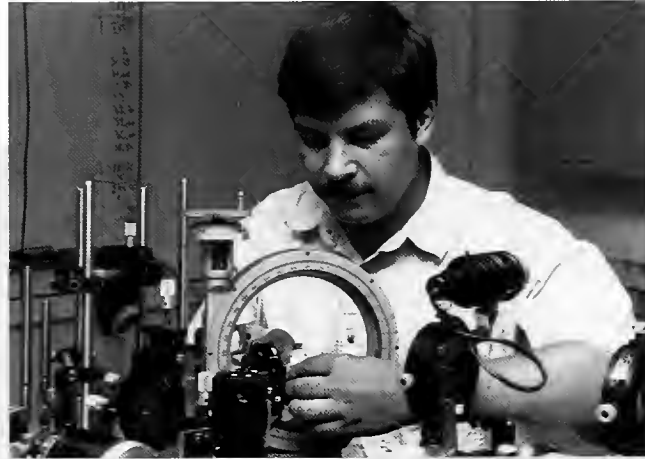
km. The deepest hole into the crust is less than 16 km. Obviously, the mantle cannot be studied by peering down a deep well.

However, the approximate composition of the mantle is

known to be mostly magnesium-iron silicates with some amount of calcium and aluminum. And it is also known from experiments which mineral phases are stable at temperatures and pressures of the Earth's interior and which

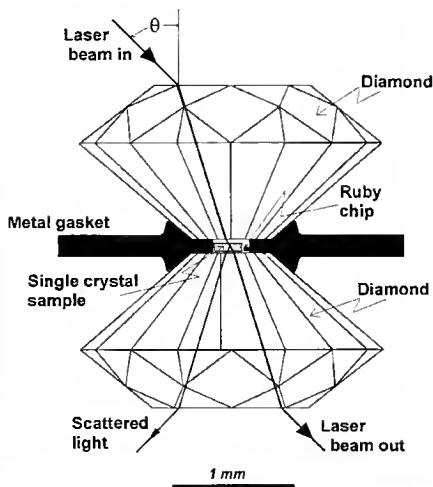
minerals simply cannot exist there.

"For example," Sinogeikin explains, "we cannot find quartz in the mantle because if you heat and squeeze it to temperatures and pressures found in the mantle

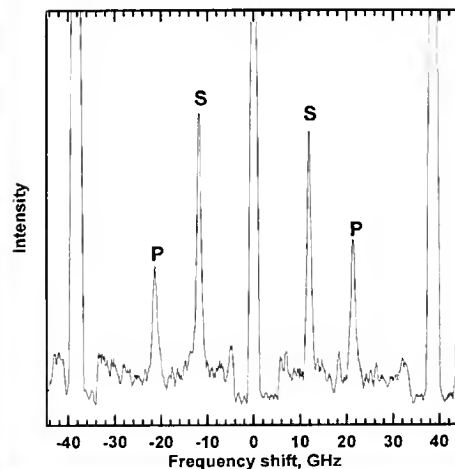


To measure various properties of mantle minerals, Sinogeikin positions samples on the Brillouin system.

Principle of diamond anvil cell



Typical brillouin spectrum of polycrystalline majorite



Two diamond anvils (left) have a metal gasket between them. The gasket has a hole (diameter 200 microns) filled with an alcohol mixture as a pressure transmitting medium. Small diameters of diamond tips allow the application of relatively small forces to obtain very high pressures, corresponding to 600-700 km depths inside the Earth. The ruby chip fluorescence is used to measure pressure inside the chamber. Focusing the laser beam on polished samples, Brillouin spectra are collected, which give direct information about sound velocities in minerals. The Brillouin spectrum (right) shows four peaks (denoted with P and S) which are symmetric with respect to the central Rayleigh peak. Frequency shifts from the peaks are proportional to sound velocities in the mineral and can be easily calculated for any experimental geometry.

it will go through phase transitions or dissolve in other silicate mineral phases. We can estimate pressures and temperatures in the mantle, but the problem is to figure out it's chemical and mineralogical composition."

As it turns out, Sinogeikin and others who are working on this problem start with a set of assumptions and constraints. First, it is assumed that the composition of the Earth should be similar to that of other planets of the Earth group, so one part of Sinogeikin's work is to study chunks of meteorites that have fallen to the Earth.

"After all, what are meteorites? At some time there was a big planet like Earth and it collapsed and these pieces of rock are traveling through space and sometimes they fall to the Earth. Their composition is not absolutely the same as that of the Earth, but it must be pretty close. Plus it's possible that we can find mantle mineral phases which cannot be synthesized in a lab," says Sinogeikin.

Another assumption is made regarding xenolites, pieces of rock that were taken by rising magma to the surface of the Earth.

"For example," Sinogeikin explains, "we know that kimberlitic magma is generated at

a pretty high depth, say 100 kilometers, or even deeper. When magma travels up it can catch and carry pieces of rocks that are in its path and bring them to the surface or close to the surface. We can find these rocks, define their mineral and chemical composition and estimate pressure and temperature at which they were formed."

At it's thinnest point,
the crust of the earth is seventy
kilometers deep. The deepest hole
into the crust is only sixteen
kilometers. Obviously, the mantle
cannot be studied by peering down
a deep well.

Geologists also know the density and pressure of the Earth as a function of depth and have a good idea of the temperature distribution in the Earth.

"If we know that the chemical composition of most of the mantle is olivine and pyroxene, we can squeeze them to some pressures and heat them to some temperatures and see what phases they go through. We can observe these phases and say that a particular phase is stable at the depth, say from 410 to 530 kilometers," Sinogeikin says.

"The mineralogy of the Earth is

a very complicated puzzle, all components of which must fit together, otherwise you will not see the whole picture. A lot of research groups in the geological sciences are working on different parts of this puzzle. Our part in this collective work is to measure acoustic velocities, compressibilities, and other physical properties of possible mantle

mineral phases. Then we refer to all other available information to try to fit our results into the whole picture or to change this picture in a way that it fits better."

Sinogeikin acknowledges that, for now, there is no direct application for this knowledge.

"We are just trying to understand how the Earth works," he says. "Once we know how it works, we can manage it better. So far it is just pure science, for curiosity's sake. In the

future, however, there are likely to be many benefits, not the least of which may be the ability to predict earthquakes."

Once he has his doctorate in hand, Sinogeikin hopes to find a faculty position where he will be able to continue his research. But whether that position will be in the U.S. or in Russia is hard to say. Only one thing is certain, according to Sinogeikin: "I'm going to stay in science."

Time Enough for Another Career: Patricia Lane

Sixteen years, three department heads, alumni by the hundreds. As administrative secretary for the Department of Geology, Patricia "Pat" Lane was the grease that made the wheel run until her retirement on June 30, 1996.

Previously a secretary in the Department of Civil Engineering, Pat replaced Ellen Abel as transcribing secretary for the geology department while John Hower was the head.

"There were many changes going on in the Department at that time," recalls Pat. "But even though it was in a transitional stage, I was glad I had made the move to geology because John was a supportive person to work for."

It wasn't long after Pat began working in the department that Hower told her she was to be responsible for writing the departmental newsletter. Pat had never edited a newsletter before, but she's also never been one to turn down a challenge. "I wondered how I was going to do it," she says, "but I was very gung-ho. If John said I should do it, then I was going to do it."

As editor of the newsletter, Pat corresponded with some of the alumni and talked with others on the phone, trying to keep up with their lives since they left the

University. She also attended social functions sponsored by GSA and AAPG.

Going to those events enabled Pat to meet alumni she would not have met otherwise. She recalls, "When I first started going to GSA

"I've made a point, all my life, of doing the things I wanted to do when I wanted to do them."

and AAPG meetings, invariably someone would make the comment, 'Oh, you are the new Rosa Nickell.'" (Rosa Nickell had been a long-time department secretary.) That link with the past was all that was needed for Pat to build a relationship with alumni she met. "I encouraged them all to keep in touch with the department."

John Hower's unexpected and tragic death in 1983 created new stresses for Pat. "That was an extremely disastrous event which of course threw the department into crisis, but it was also a very difficult time for me personally. John and I had become friends and his death affected me deeply."

Pat recalls, "Fortunately David Anderson, who had replaced John as department head prior to his death, was a very gentle man; perfect for that time when we needed a friend in the department

and a calming influence."

While working for Anderson, Pat upgraded to staff secretary and later to administrative secretary, her responsibilities steadily increasing. When Anderson stepped down in 1988, James Kirkpatrick became the new department head.

"With Jim came a new wave of transitions," recalls Pat. "He made some major changes in the way we were operating."

One of those changes, creating a position for an assistant head, meant that much of Pat's responsibilities changed as well. "Over the last seven years or so, I gradually evolved into a whole different kind of job. I guess I kind of redefined my role."

Retirement offers Pat yet another chance to redefine herself.

"I've spent the summer doing some remodeling at home," she says. "We've put new carpeting in the house, and," she smiles at this, "I'm trying to talk my husband into building a deck. He thinks perhaps he should get me another job so I stop thinking of things for him to do. We also have a new Sheltie puppy named Murphy."

Pat hopes to continue doing some kind of part time or temporary work. "I am not and never have been a housewife," she notes. "I would be very afraid, if I did not get out and get involved in something, that I would become a hermit."

One of Pat's consuming passions is machine knitting. She owns three knitting machines and



Pat says goodbye to friends and faculty members in the Department of Geology at Ned Kelly's Restaurant in Urbana. Among those who helped her celebrate were (from left to right): Jerry Magloughlin, Tom Anderson, Pat Lane, Eddie Lane (Pat's husband), Nancy Anderson, and Jim Kirkpatrick.



is a founding member of the local machine knitter's guild. Still, don't expect to find her knitting away in solitude. "Knitting machine groups have a tendency to be fond of traveling to knitting conferences around the country. I've often joked about the fact that

I don't knit much, but I travel a lot."

Pat looks upon retirement as a chance to take advantage of new opportunities.

"I think one of the advantages of retiring as early as I am is that I have the time to start another career if I want to. My parents waited to retire until they were 65,

putting things off that they wanted to do, thinking they'd have time later. Well, my mother's health got bad, so there were some things they were never able to do.

"I've made a point, all my life, of doing the things I wanted to do when I wanted to do them."

Alumni News

Obituaries

Robert M. Kosanke died April 17, 1996, at the age of 78. He worked at the Illinois Geological Survey and taught at the University of Illinois from 1943 until 1963. He was a research geologist at the U.S. Geological Survey in Lakewood and continued there as Scientist Emeritus. A Fellow of the American Association for the Advancement of Science and the Geological Society of America, Kosanke received the GSA's Cady Award in 1989 for his outstanding scientific contributions and pioneering work in coal geology.

He is survived by his wife, two sons, and one granddaughter.

James Baxter, Ph.D. '58, emeritus chief of the Illinois State Geological Survey died April 14, 1996. He was 68. He is survived by a sister and three half sisters. Memorial contributions may be made to Temple Baptist Church, Champaign.

Geology Publishing Company, publisher of *Economic Geology*.

Morris W. Leighton, B.S. '47, named chief emeritus of the Illinois State Geological Survey when he retired, received a Gaylord Donnelley-Nature of Illinois Foundation Award in 1994. The award recognized Leighton for his significant scientific and conservation efforts in the state.

Fifties

Paul E. Schnurr, B.S. '51, is recently retired after a long career in oil exploration. Upon receiving his masters degree from the University of Texas, Schnurr worked for Chevron Oil Corporation from 1955-1981 where he did offshore oil exploration off the coast of California. From 1981-1990 he worked as an exploration manager; first for Hrubetz Oil Company, and then for P.G. and E. Exploration Company. After that, he writes, "I did property evaluation for four years, and finally hung it up."

Edwin A. Welge, B.S. '51, former supervising oil and gas engineer for the Kern Co. is now retired and doing part-time consulting work.

W. F. "Willy" Weeks, B.S. '51, M.S. '53, currently professor of geophysics (glaciology) at the University of Alaska in Fairbanks, Alaska, has received the 1996 Emil Usibelli Award for Excellence in

Thirties

Dalias A. Price, A.B. '37, M.A. '38, writes, "I enjoyed the Spring 1996 newsletter and was amused at the items about me. I have not had a sex change in Denmark and still am a male. My first name has been a puzzle all my life but since it is a family name I have kept it now for almost 83 years! Also, please note the spelling of my last name."

Price continues writing and recently saw the publication of *Geography of Illinois*. He was one of other authors. Our apologies to Mr. Price, whom we formerly thought was Ms. Peice.

When we goof, we goof.

Forties

Robert J. Cordell, B.S. '39, M.S. '40, retired as president of Cordell Reports, Inc. about ten years ago. The reports, which were marketed to oil and gas companies, dealt with the geology and hydrocarbon potential of numerous regional areas. Since his retirement, Cordell has written his autobiography, about 125 essays, and narratives of the 18 foreign tours he has taken. He and his wife, Fran, continue to enjoy playing bridge and attending symphony concerts. They have three children and five grandchildren.

Paul K. Sims, A.B. '40, M.S. '42, will step down in November as president of the Economic

Research. He was cited for his work in advancing understanding of the behavior of the world's sea ice covers. The \$10,000 award honors the memory of Emil Usibelli, founder of the Usibelli Coal Company. Weeks retired in June 1996 and has since moved to Portland, Oregon where he is working on a book about sea ice.

Robert L. Brownfield, M.S. '55, is currently a graduate student at the University of Iowa.

In the spring issue of *GeoSciences* we mistakenly reported that **Richard M. Winar**, B.S. '53, M.S. '55, lived in Waterford, Michigan. He and his wife Lois live in Auburn Hills, Michigan.

Allen S. Braumiller, M.S. '57, retired in March as vice president of exploration at Helmerich and Payne, Inc. Since then he and his wife, Patsy, have founded Braumiller and Braumiller, Inc., a gas and oil exploration company which also does archaeological exploration.

Paul F. Karrow, Ph.D. '57, is a professor in the Department of Earth Sciences at the University of Waterloo. He is a member of the Quaternary Sciences Institute and

an associate of the Waterloo Centre for Groundwater Research. He teaches undergraduate and graduate quaternary geology; his current research interest is in unraveling quaternary history from many approaches.

In June 1995, Karrow was awarded the W.A. Johnston Medal by the Canadian Quaternary Association for professional excellence in Quaternary research.

Henry S. Brown, M.S. '54, Ph.D. '58, writes that after graduate school he taught for three years at Berea College in Kentucky. Then he moved to North Carolina State University where he was professor of geology and head of the Department of Marine, Earth and Atmospheric Sciences. Since his retirement in 1989, Brown has been a consultant for Geological Resources, Inc. Brown's wife, Wilda, teaches piano at Meredith College in Raleigh. Together they have five children and seven grandchildren.

Philip E. Vierling, B.S. '58, is retired after 29 years teaching general science, physical science, and earth science at Foreman High School in Chicago. Currently he pursues his avocation full

time—writing hiking and canoeing trail guides and historical publications on northeastern Illinois.

Thomas W. Lynch, B.S. '55, M.S. '58, J.D. Law '59, worked as an attorney in Tulsa, Oklahoma for 16 years. He and his family then moved to Dallas where he continued to work as an attorney in the oil business until his retirement last year as vice president and general counsel for Oryx Energy Company (formerly Sun Exploration and Production Company).

Sixties

Robert Luce, M.S. '62, currently works for The Hydrodynamics Group, a consulting company he co-founded in 1995 with fellow alumnus **John Bredehoeft**, M.S. '57, Ph.D. '62, and five other scientists and engineers. The Group specializes in ground and surface water studies, environmental investigations, and remediation.

Douglas Mose, B.S. '65, teaches environmental science and chemistry courses at George Mason University. He is also CEO of the Association of Environmental Professionals, Inc., which directs activities of investigative staff, primarily during investigations of air, water, and soil. Mose offers this insight: "The 1990s appear to be an interval of more intense student activity, in terms of academic effort. Geology majors who succeed have obtained chemistry and/or biology degrees before, during or after receiving their geology degree. As an educator and an employer of science students, single-major graduates

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

The class notes are divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

(undergraduate and graduate) cannot match the qualifications and experience of the increasingly common dual-major students."

Joseph E. Nadeau, B.S. '65, has been named vice chair of the Northeastern Section of the Geological Society of America. His scientific specialization has been sedimentary and water mass chemistry, with field studies focused on Bermuda and the Caribbean. He also serves as vice chair of the board of the New Jersey Marine Science Consortium.

Charles H. Norris, B.S. '69, started his own business in March 1996. Geo-Hydro, Inc. performs consulting tasks in geology and hydrogeology to mining, energy, and environmental industries. In May his son Aaron graduated from the University of Colorado, and his daughter Stephanie from Denver South High School. "This leaves me sharing the house with only three other carbon-based life forms," he writes. "All four-legged."

Seventies

Chang L. Lin, Ph.D. '70, is president of Canlin Trading and Consulting, Ltd., an organization dedicated to the promotion of bilateral cooperation in Asia Pacific regions. In March 1996, Lin retired as assistant deputy minister of the Department of the Environment in Nova Scotia after 26 years of service.

John Nelson, M.S. '73, currently works for the Illinois State Geological Survey. Nelson also serves as crew chief for a Champaign-Urbana group that sets off community displays for fireworks companies.

Andrew M. Gombos, Jr., M.S. '74, currently works at Exxon Exploration Company in Houston, Texas. He was transferred there in October 1995 after nearly 18 years at Exxon Production Research Company. "I am classified as an exploration geophysicist, which should surprise those who know me as a paleontologist," he writes. "I am interpreting 3D seismic data from our field in Chad, Africa. Quite exciting and interesting work."

Mike Kirby, B.S. '79, is pursuing his doctorate in hydrogeology at Western Michigan University. His research focuses on the transport of nitrates in the vadose zone and improved agricultural management practices to reduce nitrate contamination of ground water. Kirby is teaching courses in physical geology and environmental earth science. He is a certified professional geologist with AIPG and a registered professional geologist in Tennessee. He is also a registered monitoring well and pump installer in Missouri.

Eighties

John L. Shepard, M.S. '80, is now area manager for the Eastern Gulf Coast Region of Shell Oil Company and is based in New Orleans. Most of his work deals with offshore plays and includes some major discoveries.

Becky Birch, B.S. '81, writes that she has left Melbourne, Australia to accompany her husband Wayne Mudge on his three-year "foreign" assignment with Exxon in Houston, Texas.

Larry Smith, B.S. '89, has accepted a tenure-track position with the Department of Geography at UCLA. His research demands there will include synthetic aperture radar (SAR) remote sensing of melt processes in arctic Russia. He earned an M.S. from Indiana University in 1991 and a Ph.D. from Cornell University. While at Cornell he was voted most outstanding graduate student, he was a NASA GSRP Fellow, he presented an AGU outstanding student paper on the subject of hydrology, and he received the GSA Fahnestock Award. Smith has published papers on SAR remote sensing of rivers and glaciers and wavelet analysis of streamflow records.

Nineties

Christopher A. Hedlund, B.S. '90, is a graduate student at Colorado State University. He received a 1996 Grant-in-Aid from the American Association of Petroleum Geologists Foundation.

REMINDER

You can send your update for the
Alumni News section
via e-mail: geology@uiuc.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; **e-mail** geology@uiuc.edu.

Name _____ Response date _____

Home address _____ Office address _____
(indicate if changed)

Home phone _____ Office phone _____

E-mail _____

Degrees from Illinois (with year) _____ Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
Stamp
Here

Editor, *GeoSciences*
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GeoSciences

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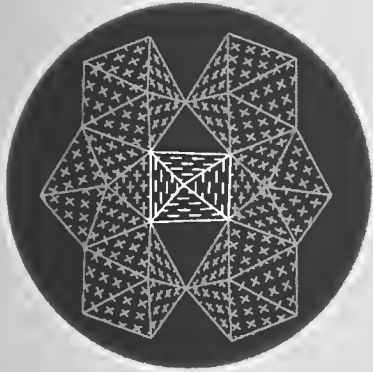
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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and spring of each year.

Staff Department Head: R. James Kirkpatrick; Assistant to the Head: Peter A. Michalove; Editor: Deborah Aronson; Production: LAS Office of Publications; Administrative Secretary: Terri George.



About Our Cover:

The structure of ianthinite, a uranium mineral that is likely to form when spent nuclear fuel is placed in a geological repository. Ianthinite is likely to collect plutonium, possibly preventing it from being released into the environment.

From the Department Head



Dear Friends.

It is with considerably mixed feelings that I write this last letter to you. I will be stepping down as department head on August 20 of this year, and although I am very much looking forward to devoting full time to teaching and research, there are many aspects of being head that I will miss. Interacting closely with alumni will certainly be one of them. During the last nine years it has been my pleasure to make new friendships and renew old ones with many of you. Every time I meet with alumni I am reminded of the great success of the department in the past and am encouraged to continue to work hard to insure similar success in the future. I have also been greatly heartened by the loyalty you have shown through support of the GeoThrust program. I will certainly continue to keep in touch.

We do not yet know who the new head will be, but I can say there are several excellent candidates and I am fully confident that the department will be in good hands. Because of the need for cooperative responsibility among the faculty, I am a strong believer that university departments do best with relatively frequent changes in leadership. Looking back, I feel very good about the remarkable progress in the department's educational and research programs over the past nine years and about our strong position as we face the future. Indeed, there are several important announcements.

The Midwest Alumni Undergraduate Scholarship endowment has reached its goal with \$100,000 in pledges, although additional contributions are still very welcome and will allow us to help even more students. The efforts in Oklahoma/Kansas and the Rocky Mountain states headed by Les Clutter and Norb Cygan to develop endowment to support student field work are also going well. In addition, although the endowment for the Texas/Louisiana graduate fellowship will not be complete for two more years, it has reached the point where we will offer a partial fellowship for the coming year.

We also are pleased to announce that Tom Johnson has joined the faculty as assistant professor. Tom has a strong background in isotope geochemistry and uses isotopic data to understand reactive transport in groundwater systems. Tom will solidify our already strong position in hydrogeology. We are also in the middle of a search for a faculty member in sedimentary geology. There are several outstanding candidates, and we are on our way to rebuilding Illinois as one of the leading places in this field.

Profiles of Peter Burns and Erick Bestland, both of whom joined us last fall as visiting assistant professors, are included in this issue of GeoSciences.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jim Klotzsch".



Midwest GeoThrust Meets Its Goal

The Midwest project launched September 21 to support undergraduate research has met its goal. The project organized alumni in 10 states in the Midwest to fund scholarships for undergraduate research projects. The fund will provide resources for students working on individual research projects with faculty. The \$100,000 goal has been met and approximately five percent of the endowment earnings will be used each year to support two undergraduate projects.

The co-chairs of the Midwest committee are Morris "Brud" W. Leighton (B.S.'47) and Haydn H. Murray (B.S.'48, M.S.'50 and Ph.D.'51). Leighton is a retired chief of the Illinois State Geological Society and chair of the Geology Department's GeoThrust committee. Murray is professor emeritus at Indiana University.

Honorary co-chairs for the committee are Park Livingston (B.S.'30) and Jack Simon (A.B.'41, M.S.'46). Livingston served 10 years on the University of Illinois Board of Trustees, and is president

Jim Kirkpatrick Steps Down As Geology Department Head

Jim Kirkpatrick will step down as head of the geology department, effective August 20 of this year. Kirkpatrick has been head for nine years, since 1988, and has served ably in this position. During his tenure the department experienced an eight-fold increase in the number of non-geology majors taking introductory courses for their physical sciences requirement. Kirkpatrick's tenure also has seen renewed contact and communication with alumni.

"As an alumnus myself, I have greatly enjoyed the opportunity to reacquaint myself with fellow classmates and to meet so many of the alumni," said Kirkpatrick.

Kirkpatrick is stepping down to devote more time to his research, which involves the use of lasers on minerals to understand their geochemical, mineralogical and petrological characteristics. His current interests include structural phase transition in minerals, the mechanisms of water/rock and water/clay interaction, glass structure, order/disorder in minerals and the structure of high-pressure minerals, as well as reaction mechanisms in reaction-bonded ceramics.

Kirkpatrick has written more than 150 research articles and has been a councilor of the Mineralogical Society of America, vice president of the International Mineralogical Association (IMA) Commission on Crystal Growth, secretary of the IMA Commission on Mineral Physics, and an Overseas Fellow of Churchill College, Cambridge.

emeritus of the board. Simon is a retired chief of the Illinois State Geological Society and the first recipient of the Geology Department's Alumni Achievement Award.

Two other projects to support field trips and summer field camp, both important parts of geology training, also have been under-

taken. Kansas and Oklahoma alumni are working under the leadership of Lester W. Clutter (B.S.'48, M.S.'51) to support field trip costs. Norbert Cygan (B.S.'54, M.S.'56, Ph.D.'62) is working with alumni in the Rocky Mountain states to support costs of summer field camp. Those projects were both begun this fall.

Richard Hay To Retire In May

Richard Hay, the Ralph E. Grim Professor of Geology, is retiring this May. Hay joined the Department of Geology faculty in 1983 and was the first person to hold the Grim professorship. Ralph Grim, the University of Illinois geologist who established the chair, was one of the founders of the clay mineralogy field.

"Ralph Grim had established this department as a center of clay mineral research, and moving here gave me the opportunity to further my research in clay mineralogy," says Hay. "With Steve Altaner on the faculty, it continues to be a real center of this kind of research, just as when Ralph was here."

Hay is best known for his work at Olduvai Gorge where he worked out the stratigraphy and helped in dating of fossil remains and archaeological sites for Louis and Mary Leakey. He was resident geologist at Olduvai from 1962 until 1974, and in 1976 he published his synthesis, "Geology of the Olduvai Gorge: A Study of Sedimentation in a Semiarid Basin." He received the Kirk Bryan Award from the Geological Society of America for this monograph and the Arnold Guyot Award from the National Geographic Society for his geological research in East Africa.

Since coming to the University of Illinois, Hay has followed two lines of research. One line, continued from work at the University of California at Berkeley, was the



The Midwest scholarship project to support undergraduate research was launched September 21. Organizers of the project were (above, from left) honorary co-chairs Jack Simon and Park Livingston and Midwest committee co-chairs Haydn Murray and Morris Leighton. Jim Kirkpatrick (left), Patricia Santagrossi and Jack Threet were on hand to kick off the project.



clay mineralogy of muds in saline lakes of the closed basins of arid and semiarid regions. Most of these muds consist largely of clay minerals formed in the saline lakes and include illite, smectite, kerolite, sepiolite and various mixed-layer species. So far he has studied the clay mineralogy of lake basins in the Amargosa Desert of Nevada and California, the Searles Lake

region of California and the Amboseli Basin of Kenya and Tanzania. Many graduate students at the University of Illinois have assisted in the clay mineral studies, which shed new light on factors responsible for neoformation of the different clay minerals.

The other line of research, begun with aid from Dennis Kolata of the I.S.G.S., is of the age and origin of K-feldspar and illite formed in uppermost Precambrian and lower Paleozoic rocks of the mid-continent. Thanks to the research of Hay and graduate students Mike Duffin, Jay Matthews and Junzhe Liu, we now have a much clearer picture of the distribution, age and origin of the K-feldspar and illite in the Mississippi Valley area.

MEMORIES . . .

On May 9 the department will hold a retirement dinner for Hay. In preparation, the geology department is seeking letters of congratulations and reminiscences from Hay's colleagues and students, which will be put in a book to present to him at the dinner. Please pass this request on to other classmates and colleagues who may have a message they'd like to present to Hay. All letters should be sent by April 23 to: Terri George, Staff Secretary, University of Illinois Department of Geology, 245 Natural History Building, 1301 W. Green St., Urbana, Ill. 61801.



Tom Johnson Joins Department Faculty

The Geology Department welcomes its newest faculty member, Tom Johnson, who arrived in January as assistant professor.

"The department has been very welcoming and that has made the transition from California a lot easier for me, as well as for my wife, Zanne Newman, and our sons, Lucas, who's one, and

Charlie, who's two," says Johnson. "Some department members even helped us take Lucas and Charlie out sledding and to the Chicago aquarium, which was just great."

Johnson is a hydrogeologist and concentrates on application of chemical measurements in studies of ground water flow and solute transport. Most of his current research involves isotope ratios such as $^{87}\text{Sr}/^{86}\text{Sr}$, that are very useful as tracers of ground water movement

and chemical reaction of water with rock.

This spring Johnson is teaching a seminar that takes an in-depth look at isotope measurements in hydrogeology. Next fall he will teach an introductory hydrogeology course.

Johnson is enthusiastic as he sets down roots at the U. of I. "One of the things that made this position so appealing to me is that we are in a phase of hiring new faculty," says Johnson. "I think everyone is excited to add new people with new ideas and energy to complement the existing strengths of the department."

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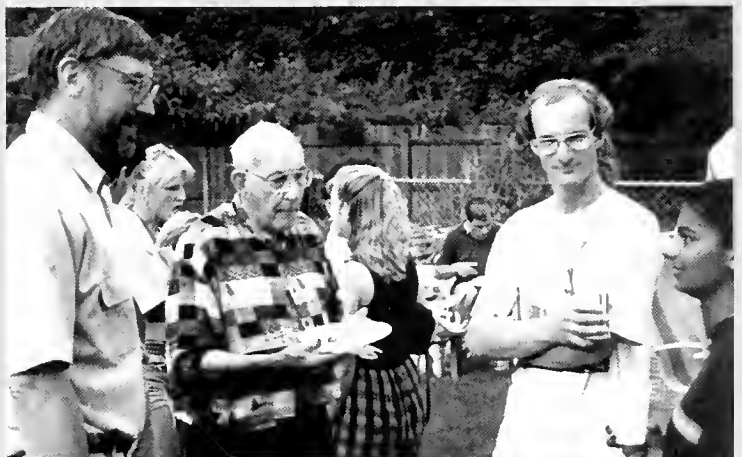
with links to:

Illinois State Geological Survey

Illinois State Water Survey

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NCSA



(At left) K. O. Emery receives the outstanding Alumni Achievement Award from Jim Kirkpatrick at the banquet held in his honor on September 6. After the banquet, an informal picnic was held at the house of Professor Stephen Marshak. On hand were (above, from left) Jim Kirkpatrick, K. O. Emery, Peter Burns and Maitri Venkataramani.

Profiles

Alumna Suzanne Mahlborg Kay And Extinct Volcanoes: A Magmatic Attraction



Suzanne Kay (in front) with colleagues next to a salt lake in the Altiplano Plateau of the Chilian Andes. Kay's colleagues are, from left, Chilean geologist C. Mpodozis, Cornell student L. Greene and Argentine geologist B. Coira.

Suzanne Mahlborg Kay (B.S. '69, M.S. '72) examines how the chemistry of volcanic and plutonic rocks are influenced by their tectonic setting. By understanding the geochemistry, geologists like Kay can reconstruct the tectonic processes that formed the magma.

Kay's study of magmatic rock has taken her from the Aleutian islands to the Andes. She has shown that magmas are very closely related to the setting in which they formed and, conversely, that by analyzing the specific magma composition, scientists can understand the tectonic activity that took place within the Earth.

"We've been looking at how the various characteristics of the lava's

chemistry are related to where that volcano sits," says Kay. "This is quite different from studies that focus on the internal magmatic processes within the volcano, and don't consider the fact that this volcano is in the Aleutians or in Japan or in the Andes."

Birth of Plate Tectonics

Kay completed her Ph.D. in 1975 at Brown University under Dick Yund (B.S.'56, Ph.D.'60). While at Brown, her interests in mineralogy continued and she branched out into plate tectonics—which was just getting off the ground—kinetics, and chemistry.

"I was in graduate school right around the time when plate tectonics started to break, and it was

exciting," says Kay. "The people just leaving graduate school were really making the discoveries, and we rode on their coattails."

Another exciting event in graduate school for Kay was meeting and marrying her husband, Robert Kay, who is a geochemist. They first met at an American Geophysical Union meeting, though Kay knew him through his work prior to that. Although the Kays are currently working on different projects, the two have published about two dozen papers together.

Kay has been at the Institute for the Study of the Continents at Cornell University since 1976. She also is an associate professor in the Department of Geological Sciences. Her husband also is a professor in the department.

Aleutian Arc

Kay's early work focused on the Aleutian arc, a chain of extinct volcanoes that are arrayed in a series of straight segments with breaks in between them. She found that those in the center have a distinct chemistry from those at the ends of the segments. The chemical composition fell in two categories: calc-alkaline and tholeiitic. She and her colleagues showed that the tholeiitic volcanoes sit at the end of the volcanic segments while those at the center are calc-alkaline.

"If you had gone to one of the ends and said 'this is a typical Aleutian volcano' as opposed to one in the center, you'd have gotten a very different story," says Kay.

Although there are various theories for the differences in chemical composition, Kay

suggests that the reason is tectonic: the segment ends were subject to different stresses than the center of the segment.

On to the Andes

After studying the Aleutian arc, which is an example of oceanic crust subducting with oceanic crust, Kay became interested in the Andes, where ocean crust subducted under continental crust. Although there is an area in the Aleutians that provides that setting, she says it was logistically very difficult to access. At the same time, some of her Cornell colleagues had been in the Andes, which is, after all, renowned for its magmatism. It seemed like a logical step for Kay to move there for a parallel study to the Aleutians.

One of the most significant elements of the project, Kay notes, was the high degree of cooperation with Chilean and Argentine colleagues, which continues to the present.

"Victor Ramos, who is clearly a preeminent geologist in South America, has been a big influence in many of the projects that I've done," says Kay.

In March, she returned from a month-long trip to the high Andes, where she worked with both Chilean and Argentinian geologists, including Contantino Mpodozis and Betty Coira.

Much of Kay's work in the Andes is geochemical, including trace element and major element analyses and isotopic analyses. She has found evidence that magmas are influenced by the angle at which the plate subducts, which differs along the Andes. The angle, she hypothesizes, affects where the melting is taking place and what is melting. By analyzing this information, Kay can not only understand what is happening along the Andes, deep beneath the crust,

but also, perhaps apply that knowledge to a place like the Himalayas, where two continental crusts have collided and neither has subducted.

Another project Kay worked on with Ramos is in Patagonia, where there are extensive basalts, volcanic rocks which are more common in oceans than on continents. This project grew out of a Fulbright fellowship Kay received in 1989.

"Victor had worked in the region for 10 years, so he had a lot of the background figured out," says Kay. "We went down and tried decipher what was going on with them. That has evolved into several other projects, as well."

For example, one of her students is studying the basalts in the southernmost region of Patagonia, east of the Chile triple junction, where the Chile rise (an ocean ridge) collides with the Chile trench.

Illinois-Accented Spanish

With all her work in South America, Kay has learned Spanish. "That has been a big thing for all the people from Cornell," she says. "As Victor pointed out, if we were going to work down there, it was our obligation to learn and speak Spanish."

Kay has mastered the language well enough to give several short courses in the modern concepts of petrology and geochemistry, as well as talks at the last four Argentine Congresses, all in Spanish.

"I have spent a month in the field without speaking English at all, so I'm pretty fluent," says Kay. "Though others do tease me that I speak with an Illinois accent."

The Argentine Geological Association has acknowledged Kay's contributions to the field, by making her an honorary member. This is a major recognition for foreign

geologists who have worked in Argentina. In addition, Kay is the first woman ever to receive the award, as well as the first native-born American.

"This award really means a lot to me, and it meant a lot to the Geological Association," says Kay.

As a young person, Kay always was interested in the natural world. Her father directed the natural history museum in Rockford, IL, and while growing up, Kay remembers being very interested in birds. In fact, she intended to become an ornithologist when she first came to the University, but her early zoology classes were filled, she found, with people who didn't share her interests, and she became disenchanted. Searching for other pursuits, Kay joining the caving society and went caving in Indiana. Through this activity she met some geology graduate students who encouraged her to take a geology class. One course was all it took for her to change her major.

"Hilt Johnson taught that class," Kay remembers. "He was a very good teacher and got people interested. Second semester I remember I took historical geology, which had an honors lab associated with it that I was very impressed with. That's where I met a lot of people who later became my undergraduate classmates."

Kay says a big benefit to her of being a geologist is learning about countries "from an inside view."

"One of the big attractions of geology to me is being able to go to places like the Andes and the Aleutians," says Kay. "I've probably seen more of the Andes from an inside view than almost any other American, at least that I know. That's because I've gone with Argentine and Chilean geologists to very remote places that you wouldn't go to as a tourist."

Alumna Sharon Mosher: A Dynamic System

Even though the Earth looks pretty stable to the average inhabitant, from Sharon Mosher's perspective, it is a dynamic system, with rocks and structures providing clues to what happened millions of years ago.

Mosher (B.S.'73, Ph.D.'78) is the Wilton Scott Centennial Professor of structural geology at the University of Texas at Austin. She focuses on reconstructing geologic events related to past plate tectonic movement in order to understand similar processes today.

The Illinois-born Mosher has conducted research in the Precambrian uplifts of central and west Texas, in west-central Arizona's Maria tectonic belt, the northern Apennines of Italy, and in the Narragansett Basin of Rhode Island. Much of her work involves studying the processes that cause deformation and quantifying its effects from a microscopic to mountain-range scale.

"I am especially interested in how mountain ranges are formed," she says. "There are different ways that you can get mountain belts. Some of them are due to collisions, either continent-to-continent or 'volcanic island arc'-to-continent. In other cases, no collision is involved. When you go back far enough into the past, it isn't always clear what has happened, because along the length of the mountain belt or at different depths, different processes are happening at the same time. Yet they are all related to the same plate interactions. It is like a gigantic jigsaw puzzle with many of the pieces missing. I've always enjoyed solving puzzles, the more complicated the better."

Mosher is a dynamic system herself. She conducts research in several areas, actively mentors dozens of students and serves on numerous university and professional committees. She also parents her two daughters, nine-year-old Lisa and 13-year-old Sarah, with her husband and fellow geologist, Mark Helper (B.S.'78).

"I have a reputation for getting things done," says Mosher, with some understatement.

Structural geologists like Mosher must reconstruct geologic events by combining field data on rock types and structures, such as folds, faults and planar fabrics, and laboratory data on the geochemistry of the rocks, the temperature and pressure conditions of deformation and metamorphism, and the absolute ages of the rocks and metamorphic events. These clues help Mosher determine what the rocks originally were (volcanic islands, continental shelf/slope sediments, etc.), and how they were deformed. This information, in turn, helps her reconstruct ancient plate tectonic movement.

Texas' Llano Uplift

Much of Mosher's recent work focuses on the Llano Uplift region of central Texas, a 9,000-square-kilometer area that contains rocks ranging in age from 1.0 to 1.3 billion years old. She and her colleagues and students have found evidence that an island arc collided with the ancient North American continent about one billion years ago.

"One of the things we have determined is that an island arc

which formed somewhere else collided with what we think was North America at that time," says Mosher. "We also are finding evidence for a continent-continent collision."

"We found igneous rocks that had the right petrology, isotopes and chemistry to be an island arc," says Mosher. "Their isotopes and geochemistry are very different from all the rest of North America. When you cross the boundary between these rocks and what we think were marginal continental shelf/slope sediments, you see an abrupt difference in the type of rocks, the geochemistry and the isotopes. The rocks at that boundary are the most deformed rocks in the entire Llano area."

All of this data gives Mosher a greater understanding of how this margin of North America may have evolved with time. Central Texas is an ideal laboratory for Mosher's work because this event has not been "overprinted" by subsequent geological events. In addition, there's been so much erosion, Mosher estimates that most of the rocks she's been looking at were probably 40 to 50 kilometers below the surface at one point. By having access to these ancient rocks, she can look at the processes that took place, and are presumably taking place today at similarly deep crustal levels.

"Working in Llano has been very exciting and educational," says Mosher. "When I first started working in the area I concentrated on the structure. No one had previously recognized the complexity of the deformation, but with the training I had from Dennis Wood, I was well prepared to unravel it. I didn't find out until much later that I picked the most complicated place to start! Since then I have tried to understand the tectonic setting that caused the

deformation of the area, and this has forced me to learn new fields."

Mosher is presently on a Dean's Fellowship research leave to continue her research in central Texas.

The Maria Belt

Another region of interest to Mosher is the Maria tectonic belt of west-central Arizona, which formed in the Jurassic and Cretaceous periods (165 to 80 million years ago). Usually, mountain ranges in the western Cordillera trend north-south parallel to the coast. However, in the region of southeastern California and western Arizona, the structures make a right-angle bend and trend east-west. This region is known as the Maria belt.

Mosher and her students have been looking at the processes of deformation that took place within the belt, and it appears that the same rocks in different mountain ranges have responded to deformation in very different ways. In some mountain ranges the rocks form large-scale (several kilometers in amplitude) recumbent folds that have then been folded again one or more times. In other mountain ranges, instead of folding, ductile faults have formed where the rock in narrow zones have flowed instead of breaking.

Mosher is now working on the question of why the structures and rock behavior are so different. The answer to that puzzle, Mosher suspects, has to do with fluids.

"I originally started working here to test a conclusion from an earlier study of the Portoro limestone in northern Italy, near La Spezia. One of my students was able to show that fluids clearly flowed along the zones that underwent translation. This migration of fluids along channels within the rock caused strain softening and allowed ductile deformation at much lower temperatures than expected. Where fluids were not present,

structural problems and has proceeded to work on the tectonic evolution of the area.

"I always try to have two large projects in different places going at one time, because I find that what I learn in one area helps me understand problems in the other," says Mosher. "I also usually have students working in many different areas, and some of them turn up exciting new places for major research projects. Other times, though, they answer inter-

esting questions, and sometimes, provide adventures."

Mosher says that her most exciting trip to "field check" a student required her to cross the Andes of Tierra del Fuego on

horseback and live off the land, which she described as "a trip of a lifetime."

For one of her earliest research projects, Mosher studied rocks in the

Rhode Island's Narragansett Basin area. Mosher and her students were the first to prove that the Pennsylvanian-aged rocks (about 290 million years old) and surrounding basement in the region were multiply deformed and metamorphosed and had been affected by an orogeny, the process of mountain building. Based on the age of the rocks, it had to be the Alleghenian orogeny, which occurred when Africa collided with North America, subsequently forming the Appalachians.

Previous to Mosher and her students' work, scientists believed that the Alleghenian orogeny did not affect New England. Since then, other geologists have



Mosher travels to the ends the Earth to check on students in the field.



brittle faulting occurred," Mosher explains. "Using the microscope, you can see how minerals making up the rock deform. If fluids were present, the minerals would deform the same way they would if they were deformed at higher temperatures. We were getting rocks deforming in ways they shouldn't have at the existing temperatures, so we expected fluids might be present. Using geochemistry and stable isotopes, we were able to document the presence of fluids."

A colleague suggested that the Maria belt would be a great place to test this finding in different rock types. This process-oriented work led Mosher to a new area, where she became fascinated by the

worked further west in the basement and have shown that the effects of the Alleghenian orogeny are widespread in New England.

A Rock in Her Hand

Mosher knew all her life she wanted to be a geologist. "My mother likes to say I was born with a rock in my hand," she says.

Mosher's parents were extremely supportive, though neither had a science background. Her father took her on many Illinois Geological Survey field trips as she was growing up, and she filled the basement with bushel baskets of rocks picked up on family vacations. Mosher says starting in fifth grade she entered geology projects in science fairs and remembers her father setting up a Bunsen burner and chemistry lab for her in the basement a year or so later.

"I taught myself chemistry in junior high using borrowed college texts, and I tried to apply what I learned to rocks," says Mosher.

Mosher's fascination with geology continued through high school and college. After receiving high honors and departmental distinction at the University of Illinois as an undergraduate, she continued her studies at Brown University with Jan Tullis, where she was one of the first to document the importance of pressure solution as a deformation mechanism. She received her master's degree in 1975, after which Mosher returned to the University of Illinois to conduct her dissertation research with Dennis Wood. Both her master's and doctoral degrees were based on research she conducted on pressure solution deformation of the Purgatory Conglomerate of Rhode Island.

Immediately upon completing her Ph.D., Mosher was hired by

the University of Texas at Austin, where she has been ever since. Over the years she has won several awards for teaching and for her many contributions to the department.

Mosher published her first paper several years before she received her doctorate and hasn't slowed down yet. To date, she has written almost two dozen articles, a book and numerous guidebooks. Her work is widely respected, and she continues to receive numerous honors and recognition, including the Association of Women Geologists Outstanding Educator

I've always enjoyed
solving puzzles, the
more complicated
the better.

Award, which she received in 1990. She was only the second recipient of this national honor.

Mosher also has been very active in the Geological Society of America (GSA). She was a founding member and the first elected chair of the GSA division of Structural Geology and Tectonics, a mere two years after completing her dissertation. This was a great honor, especially for someone so young. This division drew numerous structural geologists who previously hadn't had a professional organization, and it rapidly grew to be the largest division within GSA.

Dedicated Teacher and Mentor

Mosher also enjoys conveying her love of geology to students.

"I find the undergraduate students here very interested in geology, whether they're majors or non-majors," says Mosher. "I especially like teaching field geology. For 15 years I've been director of our six-week-long field camp, which is based in Montana. You're out in the field with the students every day and you teach them how to map and interpret the geology and structure they see in the field. That's really fun because that, to me, is what geology is all about."

Over the course of her 18 years as a professor, Mosher has supervised an unusually high number of students: a dozen doctoral students and almost two dozen master's degree students.

"I am a very active mentor to my students," says Mosher. "I try to bring out the best in each of them and to produce independent, thinking scientists. I also recognize that, being somewhat unusual, I am a role model for women and men. I represent a woman who is successful in geology, plays an active role in her family and still has a normal life."

In addition to undergraduates and graduate students, Mosher visits her two children's schools and talks to classes about rocks and volcanoes, caves, plate tectonics and other geological topics.

"I like to teach young children for two reasons. First of all, young children, even into middle school, are really interested in how the Earth works and in science. This needs to be encouraged. We all need to understand the Earth because it affects our lives on a daily basis."

"The second reason I like to go to my children's schools is because I believe it is important for kids to see women scientists. While my kids and their friends see that as normal, not all children do."

Erick Bestland: Reconstructing Ancient Climates

Wisconsin-reared Erick Bestland has always felt very connected to the landscape around him. His original interest in geology grew from his curiosity as a child about mountains.

"We traveled a lot when I was younger. And I always wondered

Climate Dictates Vegetation

"Climate, which includes temperature and precipitation, dictates vegetation types—so, for example, the natural vegetation here in Illinois is different from Floridian vegetation," says Bestland. "Cli-



Erick Bestland (right) and friends at the Pasalar fossil ape site in Turkey.

why Wisconsin didn't have any mountains," Bestland remembers. "We'd go out west and drive across the Great Plains for a thousand miles and then boom! there are the mountains. 'Why are they right there?' I'd ask myself."

Bestland, who is a visiting assistant professor in the department, doesn't study mountains, but he does study fossil soils to understand ancient climate change. His research may help answer questions of how the climate will change in the future.

mate and vegetation together make a soil different as well. In certain strata of layered rocks there are fossil soils, so if you can identify the fossil soil type you can get an idea of what kind of climate and vegetation existed."

Bestland explains that by studying hundreds of fossil soil horizons that represent millions of years of soil formation under a variety of climate and vegetation regimes, paleo-soil scientists can determine how the climate changed over time. These soils are

now exposed in rocky outcrops called badlands.

Bestland first began studying such badlands in east Africa, where he conducted his dissertation research. Lately he also has been working in Oregon, which he has shown used to be a jungle. The climate was humid and hot, with temperatures averaging in the 80s and 90s. There is extensive fossil evidence of rhinos, tapirs and crocodiles. The climate then became more temperate, with severe swings of temperature, and cold seasons included below-freezing temperatures for some months.

The geological evidence shows that the climate changed in three major steps. Those steps occurred about 42, 34 and 30 million years ago. The most dramatic one was at 34 million years ago and was caused, according to others' research, by ocean circulation and tectonic plate movement. This same plate movement caused other dramatic climate changes, too. For example, it caused Antarctica to become thermally isolated on the South Pole, says Bestland. Prior to this, Antarctica was connected to Australia and had no ice. As Australia pulled away, the oceanic and atmospheric currents cooled Antarctica to its present state.

Future Expeditions

Bestland is in the midst of planning both another east Africa expedition and research in Oregon. This time he is looking for data about the earliest grasslands at both locations. This information will help him understand the conditions for another major climatological change that scientists theorize occurred somewhere between 15 and 20 million years ago.

"Grasses thrive in cooler climates than other kinds of

vegetation, so they evolved fairly late in the whole scheme of things," says Bestland. "Evidence of early grasslands, such as a very fine soil structure with lots of organic matter, will give us information about when exactly the climate cooled enough to allow grasses. Hopefully we'll also be able to gather data about how grasslands expanded with time. My theory is that the climate was swinging back and forth at quite a high amplitude between wetter and drier conditions. Dry periods of time allow for grasslands, whereas wetter periods would encourage forest growth."

In east Africa, Bestland's grasslands research also may tie in to hominid evolution. There is a theory that the evolution of grasslands and open spaces may have contributed to the evolution of the bipedal gait in hominids. While 15 million years ago is well before the appearance of hominids, it is possible that grasslands did set the stage for other evolutionary change, says Bestland.

Bestland's research may help answer questions of how the climate will change in the future as well. For example, scientists are trying to determine how the Earth's climate will respond as humans increase the CO₂ content of the atmosphere by burning fossil fuels and increase the dust in the air with pollution.

"We have this natural experiment going on for millions of years as the planet has been here and the climate has changed," says Bestland. "Within this geologic record you can pretty much find whatever climate change you're looking for. It's an old

earth-science maxim that the present is the key to the past, but you can also turn that around a little and say that understanding the past may be the key to understanding the future."

Teaching: A Creative Endeavor

In addition to his research, Bestland is teaching two classes, sedimentology/stratigraphy for

It's better termed 'earth science' because we don't just look at rocks, and rocks being folded or crunched into mountains. We deal with the atmosphere and the ocean.

juniors and basin analysis for graduate students. Last fall semester he taught two introductory courses, Earth and environment, and introductory geology for honors program students.

"I like teaching," says Bestland. "It's a creative endeavor to broaden young people's minds. It's great, too, when the subject sparks the imaginations of stu-

dents who haven't thought about the fact that the Earth changes all the time."

"The discipline of geology has changed quite a bit over the last 10 or 15 years," Bestland notes. "It's better termed 'earth science' because we don't just look at rocks, and rocks being folded or crunched into mountains. We deal with the atmosphere and the ocean. It's more interdisciplinary and more integrated, so earth sci-

ence is a more apt term. In my most recent paper, for example, I have references from oceanography, soil science and meteorology, as well as geology and paleontology. I like that because a lot of different people can read it."

Bestland received his bachelor's degree in geology from the University of Wisconsin-Madison in 1982 and his Ph.D. from the University of Oregon in 1990.

"Being at the University of Illinois reminds me of my undergraduate days," says Bestland. "It's very similar here: a huge Big Ten school with midwestern kids and cornfields as far as the eye can see."

Bestland in the Field

Bestland's field work keeps him in touch with the landscape and the environment he enjoyed as a youngster.

"I have spent a lot of time by myself in Oregon. Completely, absolutely alone. Often a whole day goes by without my talking to anybody, so you develop a relationship with other things. The landscape...or coyotes. One time I was walking back after doing field work and there were coyote pups playing down in a gully, so I barked at them and they answered. You develop a connection to the landscape."

There were other times in Oregon when Bestland was teaching a field camp for geologists. It was here he met his fiancée, Evelyn Krull, a fellow geologist from Germany, who co-taught the camp with him. They are planning to marry this spring. Perhaps not surprisingly, the two share a passion for rock climbing, among other things.

Peter Burns: Looking Small And Thinking Big

While Peter Burns is often looking through a microscope, his mind is usually racing ahead to new applications for his findings. As a mineralogist, Burns "looks small" and "thinks big" as he probes the details of low-temperature minerals. His research in mineralogy will potentially lead to new technology critical for fields as diverse as medicine and environmental hazards, such as nuclear waste disposal.

Burns, visiting assistant professor in the department, received his undergraduate degree at the University of New Brunswick in 1988.

"I grew up in a rural community in New Brunswick and wasn't exposed to such 'exotic' subjects as geology until university," says Burns. "In an introductory geology class I had a really good professor who inspired me to major in geology. Then in my second year I started to work with Lowell Trembath, who was really influential in my focusing on mineralogy. Professor Trembath was a natural-born teacher and he got me into the lab where I worked with him on his research projects."

Burns recognized Trembath's dedication to teaching mineralogy by naming the first mineral he discovered "trembathite."

After his undergraduate studies, Burns went on for his master's degree at the University of Western Ontario and completed his doctorate at the University of Manitoba in 1994. He continued

his mineralogical research at the University of Cambridge and moved from there to the University of New Mexico in Albuquerque where he worked on nuclear waste problems.

"When studying a system like this and learning about these properties, we don't necessarily have a specific application in mind. Often, that comes later."

Considering he received his Ph.D. less than three years ago, Burns has had a busy career. He is first author on almost 40 papers and has received numerous awards and scholarships. Those awards include two from the University of Manitoba: the J.L. Lightcap Award for the Highest Standing in his Ph.D. program, and the Winthrop Spencer Gold Medal for Outstanding Achievement in Geological Sciences.

Burns makes time for hobbies, as well. He is an avid fly-fisher, having grown up next to the Miramichi River in New Brunswick. He and his wife, Tammy, travel extensively throughout North America and elsewhere and they both enjoy photography. Much of their travel and photography centers on Tammy's work as an archaeology student at the University of New Mexico.

In addition to his busy research load and multiple hobbies, Burns

is teaching several courses. He says he is happy to have resumed teaching, having focused mainly on research in Cambridge and Albuquerque.

"I love interacting with students and providing them with useful information and ideas," says Burns. "In many cases our incoming students have very little exposure to science and, hopefully, by the time they leave, they have gained an appreciation of science and how it relates to the world around them."

Atomic-Scale Investigation

Burns specializes in mineralogy and crystallography, and finds fascination in mineral's atomic-scale structures that are only visible

with electron microscopes and X-ray equipment. He is especially excited about a recent breakthrough in X-ray equipment that pushes the frontiers of mineralogy. The new X-ray detector contains a small computer chip similar to the one that is used to detect light in a video camera. Burns uses it to reveal the structures of uranium minerals that form when spent fuel or radioactive mine tailings pollute the environment.

"The new X-ray detectors introduced last year have helped tremendously in my studies of low-temperature minerals," says Burns. "Now, I can see the structures of the tiniest mineral crystals more clearly than ever before. This is really going to help in sorting out some of the biggest environmental problems."

Those environmental problems include the disposal of high-level nuclear waste. Currently the country has about 30,000 metric tons of high-level nuclear waste material

in temporary storage. Before the fuel is placed in a nuclear reactor, it contains only uranium dioxide. When the fuel is burned in the reactor, some of the uranium becomes a transuranic element (such as neptunium and plutonium), while other atoms of uranium undergo fission (the splitting of the atom) to form elements such as iodine and strontium. In total, about five percent of the uranium in the nuclear fuel becomes either a transuranic or a fission product.

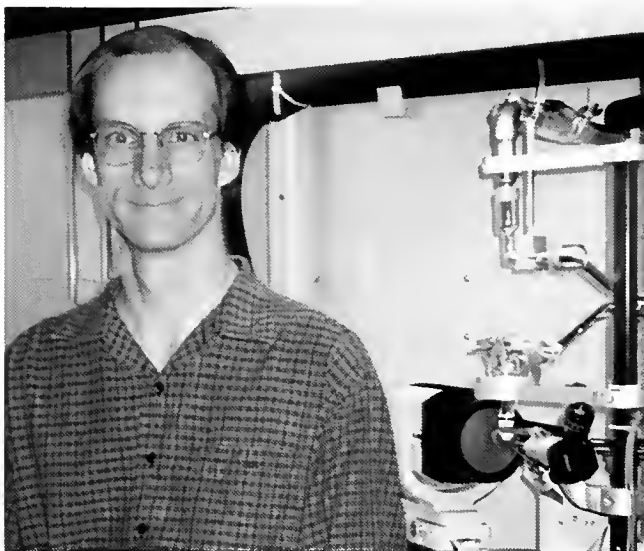
Many of these elements are highly radioactive for millions of years, so the waste is very difficult to dispose of safely. Because plutonium is highly radioactive and, studies show, can travel long distances in fluids that are always moving through rock, it is one of the most difficult to store or dispose of.

"The plan is to basically hollow out Yucca Mountain (near Las Vegas, Nev.), put the waste in, and close the door. Once this is done, it becomes a geological problem," says Burns. "Because Yucca Mountain is an oxidizing environment, you'll have the uranium dioxide of the spent nuclear fuel reacting and uranium minerals forming in place of it. This will cause swelling of the fuel rods, and they'll break apart and ultimately be destroyed.

"Most scientists start out assuming a massive release of radioactive material into the environment and then model the impact," says Burns. "Instead, I concentrate on the uranium dioxide of the spent fuel to see if the release rates of the radioactive material can be reduced."

To do this, Burns focuses much of his effort on the minerals that

form in the alteration zones of uranium ore deposits, where uraninite, the mineral analog of the uranium dioxide in spent fuel, has interacted with the environment for millions of years. By studying the geological history of uranium ore deposits, and the uranyl (oxidized uranium) minerals that form



Professor Peter Burns uses the new x-ray detector to help study low-temperature minerals.

due to weathering, Burns and his colleagues at the University of New Mexico have determined how uranium dioxide in spent fuel will behave under similar conditions. Burns thinks that the uranyl minerals that will form when the spent fuel is oxidized may be able to safely absorb much of the radioactive elements, such as plutonium, which is also in the spent fuel.

"We can't conclusively demonstrate yet that a specific uranyl mineral will take up the plutonium until we do the experiments, but our predictions are that it will at least slow down the rate of release into the environment," says Burns. "We have identified many uranyl minerals as critical to radioactive element release rates in an oxidizing environment, such as at Yucca Mountain."

Finds New Minerals

As it turns out, it's possible that information from one of Burns' other areas of research—borate minerals—might also help solve nuclear waste storage problems.

In 1987, as part of an undergraduate research project, Burns began studying a large deposit of

borate minerals in New Brunswick, Canada. The borate minerals formed when boron-rich sedimentary rocks were heated. The borate minerals captured Burns' fascination, and maintain it today, because the atomic arrangements of these minerals are more complex and diverse than any other mineral group. They provide Burns with a unique opportunity to develop theories that relate a mineral's atomic arrangement with the geological environment that it grows in.

Detailed studies of the borate deposits led to the discovery of four previously unknown minerals. Burns discovered three of them—trembathite, pringleite and ruitenbergite.

"What's important," says Burns, "is that these borate deposits are structurally unique. This fits into my bigger picture of trying to relate crystal structures and variations in the structures with the geologic environment. This deposit is unique in the world."

Two of the three minerals Burns discovered are especially unusual because they have very large open structures with big cavities and channels that run right through the structures. Burns likens their structure to zeolites (aluminosilicates with similarly open structures), which have many industrial and high-tech applications such as oil refining, water

softening and blood dialysis. These important discoveries were covered extensively in Canada, on national radio and television.

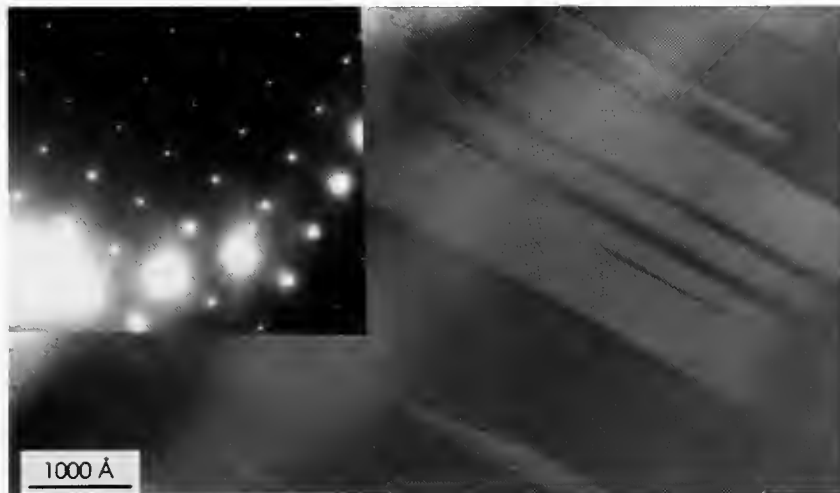
"The discovery of this new structure type was a highlight of my career to date," says Burns. "Zeolites have many applications because they are molecular sieves," explains Burns. "Certain molecules pass through the structures, but because the channels have specific sizes, larger molecules are prevented from passing. It's very important to be able to develop different structures with different size channels so you can fine-tune them to the specific use you have in mind."

The zeolite-like borates may have applications in the disposal of plutonium contained in nuclear waste, or from atomic weapons that have been dismantled. It may be possible to place the plutonium in the large channels and cavities in the borate structure. This is desirable because plutonium is a very fissile element, meaning that it can spontaneously undergo a nuclear reaction, Burns explains. However, boron is a superb neutron poison, says Burns, so the borate structure will prevent such a reaction from occurring.

Borate minerals with this zeolite-type structure were unknown until Burns discovered these three new minerals. According to Burns, this discovery opens the door to a whole new area of technological applications. Before he could synthesize these materials and perform experiments with them,

however, he first had to find out the conditions under which they form.

Burns found this information locked in crystals of boracite, another borate mineral from the same deposit, and used an electron microscope to reveal the ther-



Phase-transition-induced twins in boracite as revealed by transmission electron microscopy. The twins are due to the cubic-to-orthorhombic transition that occurs at about 310°C. The inset shows the electron diffraction pattern for the twinned area.

mal history of the borate deposit. This is possible because the boracite minerals have undergone solid-state phase transitions.

Burns' interest in solid-state phase transitions in minerals led him to the University of Cambridge after his doctoral studies, where he worked with the foremost research group in the area of mineralogy that concerns phase transitions. Phase transitions often occur when a mineral crystal cools and results in the appearance of twins, small portions of the mineral that are in a slightly different orientation from the rest. Phase transition-induced twinning is often only visible with the ultra-high resolution provided by a transmission electron microscope.

Twins are dependent upon the symmetry relations of high and low temperature phases, rather than on the specific mineral. So, as

Burns explains, the presence of twins tells a lot about the temperature at which a mineral was formed. It's also possible to get very similar twins in different minerals. While Burns concentrates on phase transitions that occur in boracite minerals, what he learns

about the phase transitions and the resulting microstructure can be useful for a larger range of minerals in different geological environments. Also, the microstructure in the boracite crystals provides information on the thermal history of the entire deposit, including the zeolite-type borates, thus providing the necessary information to begin attempting to synthesize this

unique class of minerals.

Useful Applications

In addition, boracite materials have many properties associated with these phase transitions that can be used for technological advantage. Because the optical properties of the crystals vary continuously and systematically with temperature due to the phase transitions and structural variations, they are used in adjustable lasers.

"That's really important in, say, medical applications, such as laser surgery on eyes," says Burns. "You could also use them as optical memories, optical switches, and possibly in some sort of optical computer. When studying a system like this and learning about these properties, we don't necessarily have a specific application in mind. Often, that comes later."

Alumni News

Obituaries

Jackson Smallwood Young, B.S. '27, M.S. '29, died September 1, 1995, at the Glen Retirement Village in Shreveport, LA, at the age of 90. Young was born in Urbana, IL, in 1904 and was head geologist at United Gas for 35 years. He is survived by his wife of 65 years, Lelia (Tottie); a daughter; a son; five grandchildren and two great-granddaughters.

Kenneth Edward Clegg, B.S. '50, M.S. '53, died March 4 at the age of 85. Clegg was a veteran of World War II and served at the Headquarters Regiment of the U.S. Group Control Council in Berlin. He was awarded the Certificate of Merit when he was discharged in 1946. Clegg served as a geologist with the Illinois State Geological Survey until his retirement in 1973. He wrote several publications relating to coal and coal-bearing rocks in Illinois. Following his retirement, Clegg was a consultant and free-lance geologist until 1983. He was a member of the GSA, the American Association of Petroleum Geologists and the Illinois Mining Institute.

Most recently, Clegg served on the local committee for the Department of Geology's Midwest Scholarship Endowment. He was active in the Boy Scouts and was an Eagle Scout. Memorial contributions can be made to the Boy Scouts of America, Prairielands Council, c/o Troop 10, Box 6267, Champaign, IL 61826.

Joann Scott died January 9, 1997. She was 89 and lived in Urbana. She is survived by her husband Harold W. Scott, A.B. '29, A.M. '31, recipient of the 1995 Geology Alumni Achievement Award, member of the department for 30 years, and former head of the Geology Department at Michigan State. Mrs. Scott also is survived by two sons, a daughter, nine grandchildren and ten great-grandchildren. Memorial contributions may be made to the Harold W. Scott Fellowship in Geology Fund in care of the University of Illinois Foundation, 1305 W. Green St., Urbana, IL, 61801.

Dorothy Smith, a long-time departmental secretary who retired in 1974, died December 15, 1996.

Alumni News is divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Fifties

Barbara J. (Schenck) Collins, Ph.D. '55, writes that she is a professor of biology at California Lutheran University and teaches general biology, microbiology, and environmental ecology. "I particularly enjoy teaching a summer class of the 'Wildflowers of the Sierras.'" E-mail address: bcollins@roble callutheran.edu

Lawrence. T. Larson, B.S. '57, is a professor of economic geology at the MacKay School of Mines, University of Nevada at Reno. He was chair of the Department of Geo-

logical Sciences from 1975-1991 and will retire in June 1997. E-mail address: larson@mines.unr.edu

Stanley T. Bjurstrom, B.S. '58, is a lawyer with the St. Louis-based Thompson Coburn law firm. He specializes in intellectual property and health care law.

Lorence G. Collins, B.S. '53, M.S. '55, Ph.D. '59, retired from teaching at California State University, Northridge in 1993, but still works on the study of myrmekite. He visited Finland and Norway in June 1996 to look at some myrmekite-bearing granites. His web site (<http://www.csun.edu/~vcgeo005>) includes eight different presentations. E-mail address: 103725.3674@compuserve.com

Sixties

Valentine Zadnik, B.S. '57, M.S. '58, Ph.D. '60, recently left his job

as contracts and grants officer in the Office of Energy and Marine Geology at the USGS to become chief financial officer in the Earthquake Hazards Program Office of the USAG. Zadnik plans to retire in a year or two and move back to his farm in Ohio. E-mail address: v Zadnick@usgs.gov

Richard E. Smith, M.S. '60, retired last year from the U.S. Department of Energy after working as a geologist with the Strategic Petroleum Reserve (SPR) program, which he helped launch in 1975. Smith held many positions while he was with the SPR, including chief geologist, chief scientist, and director of the SPR Environmental Safety and Health Division. Prior to that, Smith had spent nine years at the U.S. Naval Research Laboratory. He received the Distinguished Service Career Award upon retire-

ment. Smith lives with his wife in northern Virginia. They have two daughters and a grandson.

Jim Eades, Ph.D. '62, has acquired a large two-year research grant at the University of Florida.

Garnett "Guy" Dow, M.S. '62, Ph.D. '65, retired from Amoco after 28 years. Currently he is consulting for oil and gas companies. His most recent contract was with Energy Development Corporation.

Paul L. Plusquellec, M.S. '66, Ph.D. '68, is vice president of exploration and development with CNG Producing Co., part of Consolidated Natural Gas. He oversees all of CNG's exploration and development efforts. For seven years, Plusquellec also ran the operations department. Plusquellec writes, "After 28 years in the industry (Texaco 10 years, Natomas N.A. five years, CNG 13 years), I am retiring at age 55 on December 31, 1996. Plan to relax for awhile, then—maybe—look for a part-time job."

Seventies

Stephen A. Smith, B.S. '70, of Tempe, AZ, ran in the 100th Anniversary Run of the Boston Marathon April 15, 1996. He was able to finish, although enmeshed in a field of over 40,000 runners.

William Size, Ph.D. '71, is director of the geosciences program at Emory University. He writes that he "spent a month in China in August at the IGC and had a great field trip across Tibet, from the Mongolian desert to Nepal."

Dave Ripley, B.S. '65, M.S. '72, works in ground-water management for the North Dakota State Water Commission. He recently retired as the men's soccer coach at the University of Mary.

Gary Lobdell, B.S. '73, has been promoted to manager, photogrammetry of the Chicago-based Sidwell Co. He manages all topographic and planimetric data collection, editing, analytical aerial triangulation and digital orthophoto production for Sidwell.

Christopher T. Ledvina, B.S. '74, and his wife, Nancy Howe, announce the birth of triplets: Daniel, Rachel and Carrienne, on December 6, 1996. Chris, a professor of mining at Northeastern Illinois University in Chicago, was featured in a September, 1996, *New York Times* article about a coal museum he has established in West Frankfort, Ill. The museum opened August 15 with the help of donations from the mining industry. The article said this was the world's only museum at the bottom of a mine shaft.

Having decided even before graduation that geology would not be a career choice, **Lowell Bostrom**, B.S. '75, currently owns and operates an Ace Hardware store in the resort community of Woodruff, WI. He is currently building a new store and is developing the adjacent commercial property. "The hardware business was something I found by accident," he writes, "and something I thoroughly enjoy."

Elisabeth Brouwers, B.S. '72, M.S. '77, has been with the Geologic Division of the USGS in Denver, CO, for 19 years. After the division was reorganized last year, she was assigned to the National Cooperative Geologic Mapping Program, working with ostracodes. At present, Brouwers is an associate central regional geologist, working as Central Region contact/liaison with the state geological surveys, other federal cooperators, international activities, and overseeing the division common-use laboratories and support functions.

Patricia Santogrossi, B.S. '74, M.S. '77, is now principal geologist in the Department of Deep Water Geology of Vastar (formerly ARCO Oil and Gas Company) in Houston, TX. E-mail address: trisant@aol.com

Betty J. Evans, B.S. '78, has just accepted a position as application specialist at Space Imaging EOSAT, a private company launching a satellite to collect IM resolution panchromatic data. She is now based in Thornton, CO.

John D. Mitchler, B.S. '78, works for Harding Lawson Associates as a senior cost schedule manager overseeing the schedules and budgets of environmental cleanup programs. An avid mountain climber, Mitchler was recently the subject of a feature article in the *Denver Post* after having been named the first person to scale the highest points in all 63 Colorado counties. E-mail address: jmitchle@harding.com

Cummins Engine Co. has named **Christine Mangieri Vujovich**, B.S. '74, M.S. '78, vice president for bus and light commercial automotive and environmental management. Vujovich joined Cummins in 1978. She was named vice president for product planning and environmental management in 1985.

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

Eighties

Carl Steffensen, B.S. '80, is into his 15th year with Vastar Resources (formerly ARCO Oil and Gas Co.) in Houston. Having worked assignments in offshore exploration and development, onshore Mesozoic/Paleozoic basins, and lower 48 frontier exploration, Steffensen is back working the Onshore Gulf Coast Mesozoic trends. Focusing mainly on the south and east Texas areas, he writes, "I've been hooked on carbonates ever since our field trip to the Florida Keys with Phil Sandburg in 1980!" Recently, Steffensen presented posters on fractured reservoir studies and foreland basin exploration efforts, and this year co-authored a paper on the source rock potential of the Nonesuch Shale for the Institute on Lake Superior Geology annual meeting. Steffensen is also co-chair for the Houston Geological Society's North American Exploration Group. In his spare time, Steffensen acts as deputy commander for a local Civil Air Patrol squadron and works on numerous remodeling projects around his 30-year-old home. He and his wife, Frances, have two daughters.

Steven L. Forman, B.S. '81, is currently associate professor of geological science at the University of Illinois at Chicago where he teaches and conducts research in Quaternary geology and paleoclimatology. "My family and I moved from Ohio State University in Columbus, back to our Chicago home," writes Forman. "It's good to be back at the U of I." Forman also set up a luminescence dating research laboratory. Research there will focus on the loesses of Illinois. Forman credits Hilt Johnson's courses for starting him "on the path into the Quaternary." E-mail address: SLF@uic.edu

Corinne Pearson, M.S. '81, writes that she and her family just moved to The Hague for six months to a year following her husband's job with Amoco. Letters can be sent via: Expatriate - Netherlands (The Hague)/ PO Box 4381/Houston, TX 77210.

Lawrence Fieber, B.S. '83, is an environmental consultant at Mostardi-Platt Associates, Inc. Currently he manages a staff of 15 degreed scientists performing environmental investigations of land water. He also speaks, writes and teaches civil engineering courses for technical environmental professionals. He has three children, ages six, two and newborn.

Michael Sweet, M.S. '83, is a sedimentologist/development geologist now based in Houston with the Gulf of Mexico group of BP Exploration. He was previously with BP Exploration in Aberdeen, Scotland.

Mark P. Fischer, B.S. '87, recently resigned his position at the Exxon Production Research Company in Houston, TX. He is now an assistant professor in structural geology at Northern Illinois University (DeKalb, IL) and began his teaching career in August 1995. Since then he has started field projects in Mexico and southeastern Utah, and is looking for interested graduate students. Last summer he taught at NIU's field camp in the Black Hills.

Nineties

Christopher Hedlund, B.S. '90, has completed his Ph.D. at Colorado State University and now is employed with Shell Oil in Houston, TX.

Kelly Rust, B.S. '90, M.S. '93, is a graduate student at the University of Maine in Orono. He is using techniques from structural geology and geophysics to understand

the fracture flow hydrogeology in crystalline rocks. E-mail address: Krust51@maine.maine.edu

Erika Goerich, B.S. '95, works for a national environmental consulting firm, primarily on asbestos abatement projects in Chicago. She also does asbestos surveys in shopping malls across the Midwest. Goerich writes that she is "getting moved over to the 'environmental' side of the company to do Phase I Environmental Site Assessments, and other geology-related work (a promotion for me!)" E-mail address: egoerich@aol.com

Crystal Lovett, B.S. '97, received a scholarship from the American Geological Institute in September 1996. As a junior, Lovett also received a scholarship from the organization (see Geosciences Spring 1996, p. 3) Lovett, who comes from Stafford, VA, concentrated on environmental geology as an undergraduate at the University and is in the process of applying to graduate schools in environment management and law programs.

Former Faculty

George Klein, a former faculty member in the department (1970-93), has left the New Jersey Marine Consortium and opened a consulting practice specializing in "petroleum geology, coastal geology, and higher education change strategies."

Fred Donath, former head of the department (1969-77), received the University of Minnesota Outstanding Achievement Award in February 1996.

REMINDER

You can send your update for the Alumni News via e-mail: geology@uic.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; e-mail geology@uiuc.edu.

Name _____ Response date _____

Home address _____ Office address _____
(indicate if changed)

Home phone _____ Office phone _____

E-mail _____

Degrees from Illinois (with year) _____ Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

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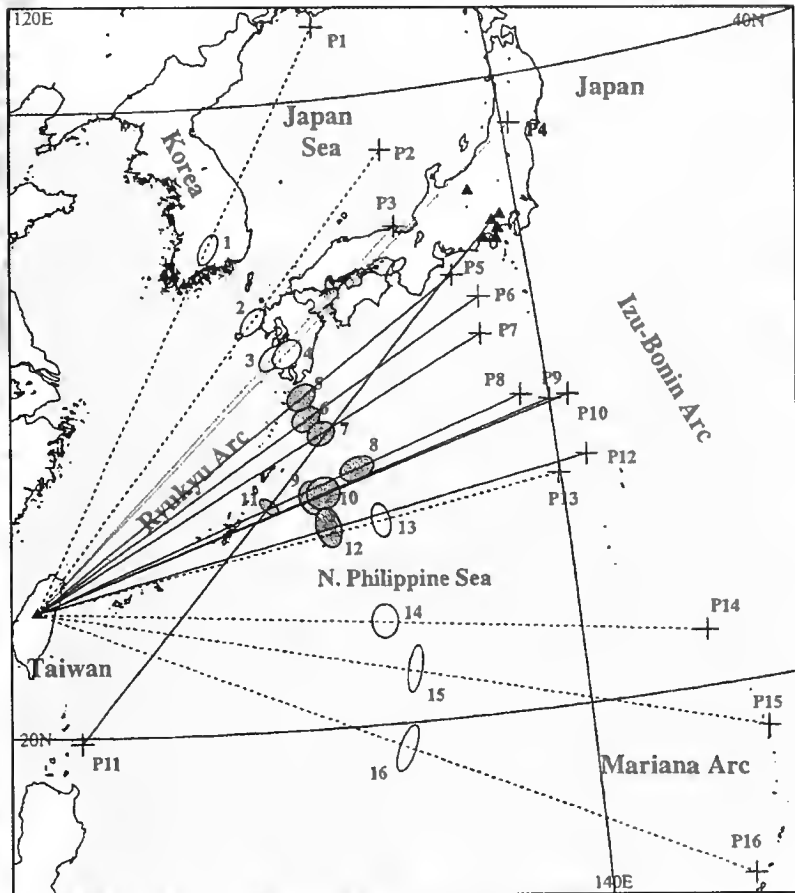
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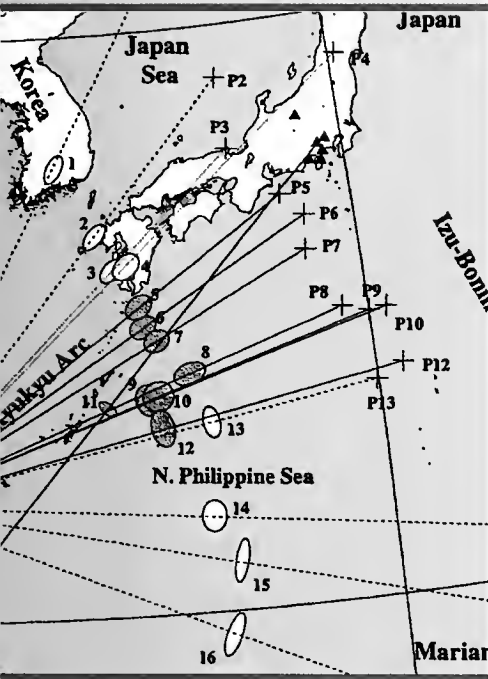


Department of Geology
Alumni Newsletter
Fall 1997

GeoSciences

Department of Geology Alumni Newsletter

Fall 1997



About Our Cover:

This map shows the configuration and main results of the northern Philippine Sea experiment. Triangles mark the seismometers used in this study. Crosses mark epicenters of 16 deep earthquakes used to construct the seismic profiles (P1-P16). Ellipses show approximate locations of the mantle transition zone. Brudzinski and Chen found that the region of high velocities (dark shading) was much smaller than previously thought.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and spring of each year.

Department Head: Jay Bass; **Assistant to the Head:** Peter A. Michalove;
Editor: Deborah Aronson; **Production:** LAS Office of Publications;
Administrative Secretary: Terri George

<http://www.geology.uiuc.edu/>

From the Department Head

Dear Alumni.

Since being appointed as the new department head this summer, I have been looking forward to meeting with alumni and hearing about your interests and ideas. There will be some opportunities for us to get acquainted at the GeoThrust meeting (Oct. 17-18), the national GSA meeting in Salt Lake City (the Geology Department will host a cocktail party Oct. 20), and at the AAPG meeting in Salt Lake City (we're holding a reception on May 18). I'll also be traveling in the coming spring for the sole purpose of meeting with as many alums as possible.

Meanwhile, there have been some recent developments in the department you might like to know about. Certainly, the most important news is the addition of two new assistant professors. Tom Johnson, a hydrogeologist who is profiled in this issue, joined our faculty last winter. This fall, sedimentary geologist Bruce Fouke is joining us. We'll profile him in depth in the next issue. Tom and Bruce are superb young scientists, and their presence will help us maintain our traditional strengths, while diversifying into new areas of teaching and research. We are indeed very fortunate to add these two faculty members at a time when competition for University

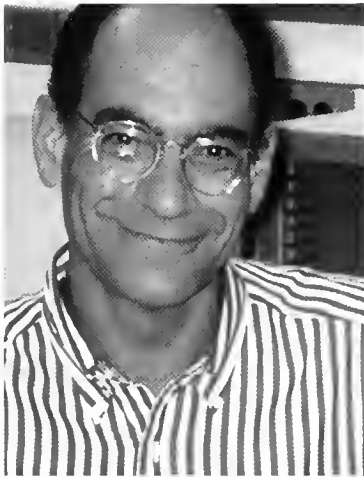
resources is very intense.

We are also beginning a search for a new R.E. Grim Professor to replace Richard Hay. All of this activity underscores the University's commitment to an outstanding Geology Department.

Our success is due in large part to the hard work of our various alumni chapters and to Jim Kirkpatrick for all the work he has done to promote active cooperation with our alumni.

As had been noted in previous issues, the Texas/Louisiana chapter has succeeded in establishing a graduate fellowship. I'm happy to tell you that we have awarded the first fellowship to Michael Brudzinski, who also is profiled in this issue. Thanks to all of you, and especially to Tricia Santogrossi and Jack Threet, for all your efforts in making this campaign a success.

Our alumni in the Midwest have been hard at work raising gifts and pledges for a Midwest Undergraduate Research Scholarship, which will support undergraduate research projects with individual faculty members. Alumni in Kansas and Oklahoma, as well as a group in the Rocky Mountain States, are working to establish a fund to support field trips. I'm sure you will all agree that field experiences are one of the most important parts of our geological training, and they often account for some of the best memories from our student years. If any of you are interested in par-



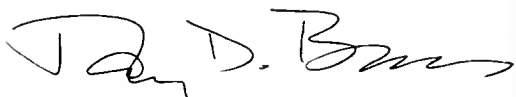
Jay Bass

participating in one of our trips, by all means let us know!

In looking at the future of the department, I have several other goals: I'd like to increase the size and national visibility of our research programs; we're going to work very hard to foster a closer relationship with industry; and we are planning an educational outreach and recruiting program. Our goal is to teach high school students about the range of opportunities in geosciences, show them the programs available at UIUC, and hopefully attract outstanding students to major in geology. I would welcome any alumni interested in participating in these new initiatives.

Again, I look forward to meeting as many of you as I can, and not only at formal departmental events. If you are in town, please stop by to visit the Department and say hello. You are *always* welcome!

Sincerely,



Jay Bass
Head, Department of Geology

Kirkpatrick Takes New Position. Department Gets New Head

Jim Kirkpatrick, who served as department head for nine years, stepped down this summer to accept a new position as executive associate dean for the College of Liberal Arts and Sciences (LAS) at the University of Illinois. The new department head is Professor Jay D. Bass, who assumed the position over the summer.

Bass has been in the Geology Department since 1984, arriving as an assistant professor. He was promoted to associate professor in 1988 and then to full professor in 1995. He received his B.S. from the City University of New York in math and geology in 1974 and his M.S. in geochemistry from Lehigh University in 1977. Bass received his doctorate in 1982 from the State University of New York, Stony Brook.

As a post-doctoral fellow at CalTech from 1982-84, Bass conducted research on Earth materials at high pressure using shock waves and also borehole geophysics.

Bass has served on a variety of departmental committees, most notably the Courses and Curriculum Committee, which restructured the undergraduate course offerings in the department, and chaired the department's Promotion and Tenure Committee. Nationally, he has served as a panel member in the Geophysics and Geochemistry Programs of the National Science Foundation.

Since arriving at UIUC, Bass has taught geophysics, introductory geology, mineralogy, various courses on the physics and chemistry of the Earth's interior, and Geology of the National Parks, a popular geology course for non-majors. He conducts research on seismic velocities and elastic properties of minerals and rocks at high pressure and high temperature, as well as on the chemistry of Earth's interior and the properties of silicate magmas. For much of this research Bass uses a type of laser light scattering called Brillouin scattering.

Kirkpatrick had been planning for some time to step down and devote himself to research, as we wrote in the previous issue of Geosciences. However, when Dean Jesse Delia asked him to become executive associate dean for LAS, Kirkpatrick agreed.

This is a new position; LAS has never had senior-level associate deans with substantial academic responsibility before. Kirkpatrick will help coordinate interactions between 21 LAS departments that include mathematics and physical, biological, and social sciences. One of his special tasks will be to help coordinate the reorganization of the School of Life Sciences (SOLS).

Students Receive Departmental Honors

Last May several geology students received departmental awards in recognition of their academic achievements.

Crystal Lovett and Cathy Hier received the Alumni Outstanding Senior Award.

The Estwing Award to an outstanding undergraduate went to **Maitri Venkataramani**.

Melinda Tidrick received the outstanding woman graduate student award.

The outstanding teaching assistant award for spring 1996 went to **David Finkelstein and Deborah Watson**; **Tara Curtin** was the outstanding teaching assistant for fall 1996.

Graduate student **Joel Johnson** received the Morris M. and Ada B. Leighton Award. This award, established in memory of Morris W. Leighton's parents, provides funds to support field work and research by an outstanding graduate student. The award will help Johnson in his study of the structural geology of the Illinois Basin. His work will incorporate both subsurface and outcrop data from selected locations in the region.

Undergraduate **Alex Glass** and graduate student **John Werner** have received the Norman Sohl Award in Paleontology this year. This award was established in the memory of one of our most distinguished alumni, Norman F. Sohl, B.S. '49, M.S. '51, Ph.D. '54, who

died in 1993. Sohl spent much of his career at the Smithsonian Institution and was a leading authority on Cretaceous gastropods and biostratigraphy.

Glass used the award to study fossils from the Hunsrueck Slate geological formation, which is in the Rheinsche Gebirge region of Germany. The Hunsrueck Slate formation has a large number of exquisitely preserved sea lilies, star fish, brittle stars and other marine animals. Glass traveled throughout Germany, since the collections are scattered throughout the country. His research is part of the Nahecaris Project, a salvage operation run by the German government. "The award was like a gift from heaven," says Glass. "I had no idea it was com-

ing, and I wouldn't have been able to do this research without it."

Werner, who also received the award in 1994, used his award to study the Smithsonian Institution's collection of fossil scallops. His research focuses on how the scallops changed and how rapidly they did so. His trip to the Smithsonian in July was a success. He met and discussed his work with Dr. Thomas Waller (a world expert on fossil and recent scallops) of the National Museum of Natural History and took nearly 3,000 measurements on fossil scallops that ranged in provenience from Florida to North Carolina. The fossils ranged in age from one to three million years old.



Do you recognize this space? You should—it's the main lecture hall, room 228, getting a complete renovation.

Sedimentologist Joins Department

Sedimentologist Bruce Fouke has just joined the Geology Department as assistant professor.

"I'm thrilled to be here," says Fouke, who moved here with his wife, Ann, and their 10-month-old daughter Kaitlyn. "I love it here in Champagne-Banana!"

Fouke specializes in reconstructing the composition and history of ancient aqueous envi-



Bruce and Ann Fouke with daughter Kaitlyn at tide pools in Morro Bay, California.

ronments. He combines geology, biology and chemistry to quantitatively reconstruct paleo-fluids, which includes answering such questions as whether microbes lived in a given water environment, what the water was composed of chemically, and the ancient hydrology.

Fouke has worked on a wide range of projects, from ancient coral reefs to examining the Creta-



The party honoring Richard Hay was held at Silvercreek Restaurant and was a great success. From left, Duane Moore, Ralph Langenheim, Jim Kirkpatrick and Shelley Roberts.

ceous-Tertiary (KT) meteorite impact that "dinged the dinosaurs." He has also worked with several oil companies.

"My specialty is applicable to a wide range of fields," says Fouke. "Almost every discipline, whether it's geosciences, archaeology or even veterinary medicine, has a need to know the history of water and porous media," says Fouke. "I guess, I live by the credo that variety is the spice of life," he adds with a grin.

This past summer, Fouke worked at NASA's Ames Research Center near San Francisco, where he was part of a research team in exobiology. That work has led him to the Mammoth Hot Springs in Yellowstone National Park, where he is studying how microfossils are preserved in order to better understand the presumed "microfossils" entombed in calcite cements in the Martian meteorite ALH84001.

Geology Alum Honored by University of Waterloo

The Waterloo Centre for Groundwater Research at the University of Waterloo in Ontario, Canada, has initiated the Farvolden Distinguished Lecture Series. The series honors Dr. Robert Farvolden, Ph.D. '63, whose leadership was responsible for the foundation and development of the University of Waterloo's hydrogeological teaching and research facility. Farvolden died Sept. 13, 1995.

Stephen Foster, an assistant director at the British Geological Survey and visiting professor in contaminant hydrogeology at the University of London-Royal Holloway College, presented the inaugural lecture entitled "As the Land, so the Water: Assessing and Controlling Agricultural Impacts on Groundwater."

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Profiles

First Texas-Louisiana Fellowship Awarded to Graduate Student Mike Brudzinski

Seismology graduate student Mike Brudzinski felt called to academia from an early age.

"I always enjoyed school tremendously," he says. "And I enjoy the combination of teaching and research. You are learning, and teaching what you are learning. It has always seemed like a very fruitful endeavor, regardless of what subject you study."

Brudzinski, who graduated in three years from Eckerd College with a double major in physics and marine science, received in 1997 the first Texas-Louisiana Fellowship from the Department of Geology in recognition of his outstanding achievements as a graduate student.

Alumni from Texas and Louisiana, led by Jack Threet and Patricia Santagrossi, recently created this endowment to provide a permanent source of fellowships to outstanding graduate students



Mike Brudzinski, recipient of the first Texas/Louisiana Graduate Fellowship, reviewing "wobble plots" with his advisor, Wang-Ping Chen.

like Brudzinski.

"The fellowship was a great surprise and a great help," says Brudzinski. "I was planning on being a teaching assistant half-time this year, but thanks to the fellowship I only have to teach quartertime. That means I can devote more time to my research."

This is one of many honors for Brudzinski, who as an undergraduate was valedictorian, did research for three (now published) papers, attended four professional conferences and received

numerous awards. He attributes his success as an undergraduate to his mentor, Sarah Kruse, and to his first undergraduate research conference, which made it clear that there was more to academia than just classes. "One unusual aspect of Mike's background is that he

had a lot of research experience as an undergraduate," notes his advisor Wang-Ping Chen, professor of geology.

Brudzinski's graduate school experience has been very positive so far, as well. He received the Geology Alumni Fellowship upon his arrival at Illinois in 1995, as well as a scholarship from the Society of Exploration Geophysics.

"Mike has been very successful because he has a good combination of characteristics, which include intelligence, perseverance, a great ability to work with other people, a good ear for advice and an outgoing personality,"

says Chen. "Mike has a very positive outlook on things. He is not flustered by roadblocks, which, of course, are common in research."

Seismographic Study of the Mantle

These days, Brudzinski can most often be found hunched in front of a computer, reading seismographic data, or "wobble plots," from around the world in order to understand the mantle transition zone.

The mantle is made up of an upper and a lower portion. Between the two layers is the mantle transition zone, about 400-660 kilometers deep.

"The transition zone is an interesting region because people want to know about the differences between the upper and lower mantle," says Brudzinski. "We are asking questions like, how the upper and lower mantle are related, and what effect the mantle

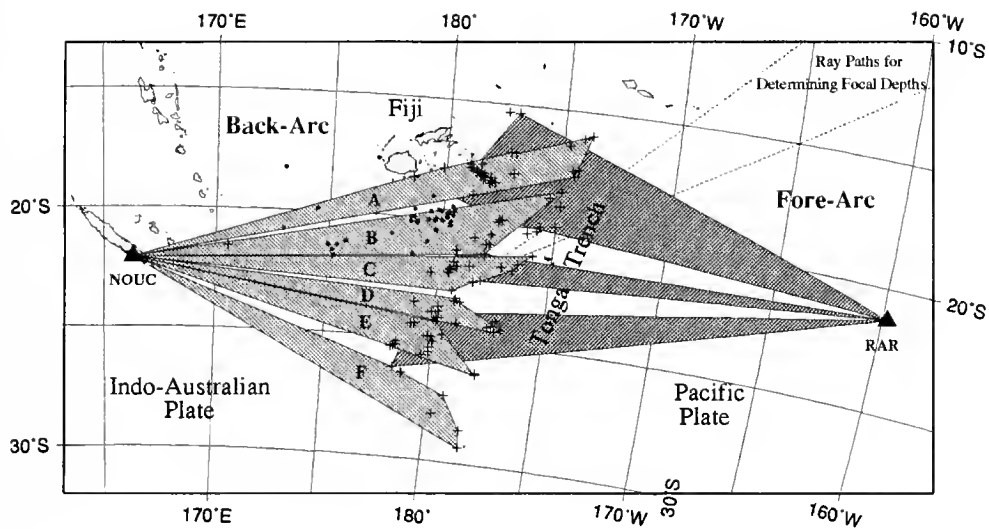
seismograms to the real recorded data in order to investigate the velocity structure of the Earth." When Brudzinski finds areas where the data don't fit the model, he refines the model and tries to explain reasons for the deviance.

Brudzinski recently co-authored a paper with Chen that examines the velocity model for the northern Philippine Sea. Seismologists have thought that this entire region was fast, which indicated the

is subducting it makes sense it would rest at the bottom of the tub, so to speak," says Brudzinski.

Chen points out that this finding raises new questions. "We know the lithosphere is subducting in this region, but based on our most recent findings, it would beg the question, 'where IS the rest of the crust?'" he says.

Brudzinski's current research focuses on similar questions in the Tonga Trench region, identified by



Map showing the configuration of the Tonga-Fiji experiment. The Tonga-Fiji region is home to half of the world's deep earthquakes and seismologists have identified high velocities in the mantle transition zone, which may be similar to those found in the northern Philippine Sea. Triangles mark the seismometers and crosses mark epicenters of deep earthquakes used in this study. Brudzinski and Chen are investigating whether the velocity structure in this region supports the presence of subducted slab stagnant within the transition zone.

transition zone might have on tectonic processes within the Earth.

"I look at waveforms, or seismic wave data, and try to determine the seismic wave speeds, which contain information related to the composition and temperature of the Earth. I put the model of seismic wave speeds into a program that creates synthetic seismograms and then compare those synthetic

presence of subducting lithosphere in the middle of the mantle transition zone. Brudzinski and Chen found instead that the region of high velocities was much smaller than previously thought. They also found that the high velocities were in the lower transition zone, not in the middle of the transition zone.

"We think this is a better explanation because, if the lithosphere

a group of islands east of Australia near Fiji. The Tonga-Fiji region is home to half of the world's deep earthquakes, and seismologists have identified high velocities in the mantle transition zone similar to those found in the northern Philippine Sea. He and Chen will compare the plentiful Tonga-Fiji data to their findings in the northern Philippine Sea and see what

they can learn.

"...Heart and Soul of Geophysics"

Although Brudzinski has always been interested in science, he didn't narrow in on geophysics until college.

"Based on the number of turtles and frogs I brought home as a kid, my mom always thought I'd be going into biology," says Brudzinski. "But in college I realized that physical principles are a lot more interesting to me than biology, and these same principles are the heart and soul of geophysics."

Brudzinski chose to attend Eckerd College, a 1,400-student school in St. Petersburg, Fla., because of its strong marine sciences program. After a few classes he found that he preferred physics and physical principles to biology. Marine geophysics allowed him to apply the principles of physics to "lots of data provided by the Earth."

The gregarious and earnest Brudzinski flourished at Eckerd, and became deeply involved in both academics and campus life. By the time he graduated, he knew he wanted to continue studying geophysics, but he wasn't sure what area. He was drawn to Illinois and seismology in part because of MIT-trained Chen.

"He's very intense about research, and I am too, so our per-

sonalities mesh," says Brudzinski of Chen. "His reputation in the department is something of a slave driver, but we get along really well.

"Coming to the University of Illinois also appealed to me because I'm originally from Chicago, my fiancée (Erika Bondarowicz)

"But I am enjoying Illinois, too. Resources were pretty thin at a small school like Eckerd, particularly when it came to research.

"There are tremendous resources here, but you're pretty much on your own, since the school is so big. Still, geology is self-contained and I've gotten to

know many people in the department," says Brudzinski. "Illinois also gives me a chance to be around other geologists, whereas at Eckerd I was in a marine science department and there weren't very many geologists."

In addition to spending time with geologists and with Bondarowicz, Brudzinski tries to find time for his latest pet turtle, Kermit.

"Kermit is the best pet I've ever had," says Brudzinski earnestly. "He has an amazing amount of personality ... for a turtle. He has moods just like a person. Sometimes he's lazy, scared, excited, or

just plain bored. Even in the pet store he was playing peek-a-boo from behind a log with me. At home he's great because he's totally low maintenance. He can go a week without food, he doesn't smell bad, and he can climb just about anything. You don't have to pay attention to him, but he's there to play with when I have time, which isn't often these days, I'm afraid."

Hopefully, Kermit understands.

"Mike has been
very successful because he has
a good combination of characteristics,
which include intelligence,
perseverance,
a great ability to work
with other people,
a good ear for advice and an
outgoing personality,"

was here in school, and they offered me the Geology Alumni Fellowship," adds Brudzinski.

Big Fish. Small Pond

Moving from Eckerd to Illinois was shifting from being a big fish in a small pond to a small fish in a much bigger pond.

"Eckerd was really good for me," acknowledges Brudzinski.

Johnson Tracks Ground Water Using Isotope Ratio “Fingerprints”



Tom Johnson working in his “clean lab.” Because the samples he works with are so infinitesimal, the slightest dust particles can contaminate his work. Johnson wears special clothes, including shoes, to work in this lab.

Tom Johnson, assistant professor of geology, started out in igneous petrology, took a two-year break from academics, and metamorphosed into a hydrogeologist.

“After taking that break I decided I wanted to do something with more of an applied approach,” said Johnson, who received his Ph.D. from the University of California, Berkeley, in 1995.

The shift was not as dramatic as it might have appeared, notes Johnson.

“Many of the aspects of high-temperature geochemistry that I worked on in igneous geology are surprisingly easy to apply to low-temperature geochemistry,” Johnson observes. “It turns out not to be a very big jump.”

Johnson concentrates on the application of chemical measurements, particularly isotope ratios, in studies of ground-water flow

and solute transport. Most of his current research involves isotope ratios, such as $^{87}\text{Sr}/^{86}\text{Sr}$, that are very useful as tracers of ground-water movement and the chemical reaction of water with rock.

“Isotope ratios give you a way to fingerprint elements from different sources,” says Johnson. “Although the use of isotope ratios is a well-established technique, applying these measurements to ground water is relatively new,” says Johnson. “For this reason I find my research more and more compelling. Some of the things I’m working on now, no one else in the world is doing. I find that really exciting.”

In one such project, Johnson has succeeded in developing the first practical techniques for measuring natural variations in selenium (Se) isotope ratios.

Cretaceous rock formations all over the western US, among other places, are very high in selenium. Selenium is toxic in high concentrations, which can be fatal to wildlife. The most dramatic illustration of this situation is found at the Ketterson Wildlife Refuge. The refuge had several large ponds that attracted migrating aquatic birds. However, the ponds were created using agricultural waste water from soils high in selenium. Consequently, in 1983-84 those migrating birds died by the thousands due to selenium poisoning.

Activity at the Ketterson site has quieted down, but a new concern is wastewater from oil refineries located on San Francisco Bay. There is concern about the effect of the effluent, which is also high in selenium, on the bay’s ecology. Johnson hopes to use his isotope ratio research to fingerprint the sources of selenium, and to determine whether they are naturally occurring or manmade. This will help determine how to remove the selenium from the environment or

render it inert, he says.

Selenium in Nature

A second use for the isotope ratio study of selenium is to give information about how selenium behaves in the natural environment, Johnson says.

There are several different forms of selenium in the environment, and there are wide variations in their mobility and bioavailability. The more bioavailable the form, the more toxic it is. Selenium can be taken from the toxic form and transformed, by either biological or chemical processes, into a relatively inert material. Johnson's goal is to study selenium in nature and understand how it cycles.

Multiple Sources and Routes of Contamination

Johnson, who has been at the Geology Department for only nine months, is also continuing to work on projects he began as a post-doctoral researcher at the Lawrence Berkeley National Laboratory in California.

One is a study of $^{87}\text{Sr}/^{86}\text{Sr}$ ratios in ground water of the Snake River Plain aquifer of Idaho, which provides information on where water is flowing and at what speeds.

"The hydrogeology is difficult in this region because the basaltic/fractured rocks of the aquifer are very chaotic and flow conditions are hard to predict," says Johnson, who has found that groundwater

flow is channeled into "fast flow zones."

This finding could greatly influence understanding of contaminant transport.

Johnson also has been involved in site characterization of the proposed nuclear waste repository at

similar to those he's using in his selenium studies, Johnson will measure $^{15}\text{N}/^{14}\text{N}$ ratios and $^{18}\text{O}/^{16}\text{O}$ ratios to help identify the source of the nitrates. He hopes the information he gains will help identify, for example, which fertilizer is causing a particular contamination.

"This approach is very close to the selenium approach," says Johnson. "If we can fingerprint the isotope ratios, it might identify the different sources of nitrates in ground water. I'm also hoping it will help us understand the processes that break down nitrates, particularly the process of de-nitrification, which can change nitrates into harmless nitrogen gas. Certain shifts in the isotope ratios over time, for example, will help us find evidence for de-nitrification."

Isotope ratio research also might come into play in a future project Johnson hopes to collaborate on

with Steve Marshak, professor of geology in the department. That project involves looking at isotope ratios of helium coming from major fault structures in the mid-continent. It would involve using helium isotope ratios as a fingerprint for fluids leaking from the mantle into the crust.

Transitioning to Champaign-Urbana

Johnson's seemingly bottomless supply of energy extends not only to his numerous research projects, but to his teaching responsibilities.

The Keterson Wildlife Refuge
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Yucca Mountain.

"It is very difficult to predict the behavior of such a site for ten thousand years, as is mandated by law, and this requires a geological perspective," says Johnson. " $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of ancient ground water are recorded in secondary calcite crystals; these data tell us about the long-term behavior of the hydrologic system."

In conjunction with the Illinois State Geological Survey, Johnson also plans to look at nitrate contamination in ground water around the Decatur, Illinois, area caused by fertilizer run-off from nearby farms. Using techniques

When he first arrived, Johnson took on the responsibility of teaching a new course on isotope measurements in hydrogeology.

"I enjoyed teaching very much, but there was more preparation and organization than I anticipated," he acknowledges with a grin. This fall Johnson is teaching an upper-level hydrogeology course to undergraduate geologists and engineers. At the same time, he'll have his first graduate student and will hire a post-doc-

the University of Illinois, for example, there are perhaps ten times as many students and there are 14 geology faculty."

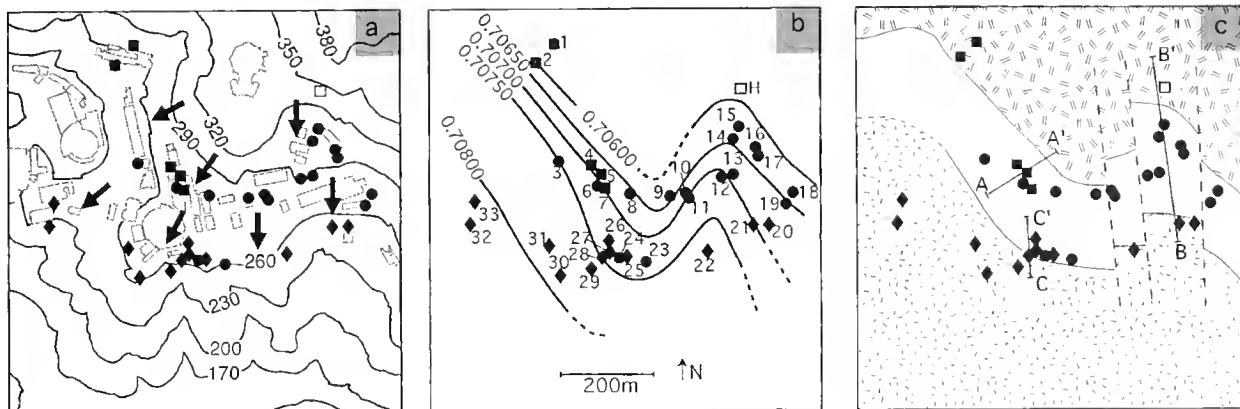
As an undergraduate, Johnson received a research fellowship at California Institute of Technology in Pasadena the summer before his senior year. That project became his senior thesis on igneous petrology, for which he received the Walter F. Pond Prize in Geology from Amherst.

Johnson not only had a reward-

on—these days, but he's settling in just the same. He is particularly excited and energized about being at the University of Illinois.

"One of the things that made this position so appealing to me is that we are in a phase of hiring new faculty," says Johnson. "I think everyone is excited to add new people with new ideas and energy to complement the existing strengths of the department."

Adjusting to Midwest weather, however, was a different matter.



The figure above shows three aspects of the Lawrence Berkeley Laboratory groundwater system. a) Topographic contours in meters, locations of buildings, and approximate ground-water flow direction. b) Contour plot showing the evolution of $^{87}\text{Sr}/^{86}\text{Sr}$ in ground water as it flows through the site. c) The complex geology of the site, with basalt overlying Miocene and Cretaceous siltstones that dip 30 degrees to the north. Ground water inherits relatively low $^{87}\text{Sr}/^{86}\text{Sr}$ values from the basalt, then flows into and interacts with the higher $^{87}\text{Sr}/^{86}\text{Sr}$ siltstones. The strong gradient in the Sr isotopes indicates very slow ground-water flow.

toral researcher to work on the Snake River Aquifer project.

Although he spent a decade in California, Johnson comes from the East Coast. Growing up in Suffern, New York, not far from Columbia University's Lamont-Doherty Geological Observatory, Johnson wanted to attend a small, liberal arts college. He chose Amherst College, which traditionally has been strong in geology.

"For a college of its size, Amherst's geology department is huge," says Johnson. "There are five geology faculty for a student body of about 1,600, whereas at

ing experience at Amherst; his college connection led him—albeit circuitously—to meet his wife, Zanne Newman.

"We met in California while mountain biking," Johnson remembers. "She was wearing an Amherst jacket, so I struck up a conversation with her. Ironically, it turns out she was there when I was there. She went to Wellesley and had spent her junior year as an exchange student at Amherst. I ended up inviting her to a party I was having."

Johnson doesn't have the time to bike—or the mountains to bike

Johnson, Newman and their two sons, one-year-old Lucas and three-year-old Charlie, arrived in Champaign-Urbana in the middle of the winter.

"I wouldn't do that again if I could help it," says Johnson ruefully.

With the support of the department, Johnson and his family are feeling more at home.

"The department has been very welcoming and that has made the transition from California a lot easier for me, as well as for my wife and our sons," says Johnson.

Witherspoon Provides “Powerful Role Model” Throughout Successful Career

Petroleum engineer and hydrogeologist Paul Witherspoon, Ph.D. '57, is internationally renowned as an imaginative and creative researcher. He has spent his career studying, among other things, how fluids flow through fractured rock. He also has served as an outstanding mentor to numerous other researchers who have gone on to become very successful hydrogeologists.

Witherspoon was awarded the 1997 University of Illinois Geology Alumni Achievement Award. He adds that honor to a string of top awards and honors, including being elected to the National Academy of Engineering and as a foreign member of the Academy of Sciences of Ukraine, in recognition of his work there following the Chernobyl nuclear disaster. He was recently elected a fellow of the American Association for the Advancement of Science, and just last year received the distinguished service award from the hydrogeology division of GSA. Earlier in his career, Witherspoon received the Horton Medal, the top award from the American Geophysical Union for “outstanding contributions to the geophysical aspects of hydrology.”

The American Geophysical Union also honored him with the Horton Prize for the best paper in

hydrology (published in *Water Resources Research* in 1969), and the GSA awarded him the 1972 O.E. Meinzer award for an article titled *Field Determination of the Hydraulic Properties of Leaky Multiple Aquifer Systems*. Witherspoon shared both of these top awards with former student Shlomo Neuman, now Regents' Professor in the Department of Hydrology and Water Resources at the University of Arizona, Tucson.

“If it weren't for Paul Witherspoon, I wouldn't have had a research career,” says Neuman. The Israeli native came to the United States in the mid-1960s to get a master's degree in hydrogeology, then return home and solve Israel's water problems. Instead, Witherspoon set him on a research career, and Neuman has been very successful—one of many successful researchers Witherspoon has guided.

“I've been able to work with a large group of talented men and women,” says Witherspoon.

In addition to Neuman, those students include Al Freeze, Witherspoon's first Ph.D. student in geological engineering, who is now a well-known consultant working on contamination problems in the U.S., as well as Europe. One of his first women doctoral students, Jane Long, has just been selected to be dean of McKay School of Mines at the University of Nevada, in Reno. And many of Witherspoon's students are affiliated with the Lawrence Berkeley

National Laboratory (LBNL), including Gudmundur Bodvarsson, who is head of the Nuclear Waste Group at LBNL.

Natural Curiosity

What makes Witherspoon's career unique, says Craig Bethke, Ph.D. '85 and geology professor at the University of Illinois, is that “he is an incredibly broad person professionally. He has a real curiosity. When he wonders how something works, he examines it, he solves it to his satisfaction and moves on to the next project. He is very imaginative and very popular among his colleagues.”

Neuman agrees.

“One of the things that made Paul so inspirational as a teacher was that he was constantly on the lookout for new and interesting problems and ways to address them,” says Neuman. “He also has always provided a cheery, self-effacing, but powerful role model for generations of students and colleagues.”

Witherspoon's projects have included examining the effect of topography on regional ground water flow through heterogeneous geologic media, helping develop new mathematical solutions to problems associated with pumping tests in multilayer aquifers and fractured rocks, developing computer models of flow systems, and examining the relationship between fracture roughness, normal stress and fluid flow, and on the thermomechanical properties of fractured rock samples.

Colleagues all describe Witherspoon as an outstanding teacher and one-of-a-kind researcher, yet he didn't always know he wanted to go into research or teaching. The son of man who worked in the natural gas industry, Witherspoon grew up

outside of Pittsburgh. He entered petroleum engineering via the University of Pittsburgh, receiving his B.S. in 1941.

After graduating, Witherspoon spent several years with Phillips Petroleum in Oklahoma and Texas. During World War II, the company received a big defense

Elizabeth Talbott, who was working for Phillips Petroleum.

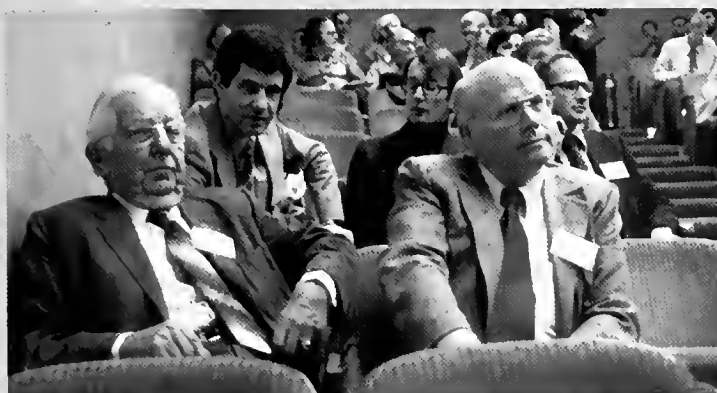
After several more years of working for Phillips, Witherspoon was ready for a change. While not planning on pursuing an academic career, he did decide to get more education.

"At this point I realized that I

Witherspoon was hired to serve as head of the Illinois State Geological Survey (ISGS) division of petroleum engineering in Urbana.

While working at the ISGS, Witherspoon discovered the importance of storing natural gas underground in aquifers and especially of selecting geologic condi-

Clockwise from left: Paul Witherspoon; The Witherspoon clan in Washington, D.C. last spring to recognize Paul and Elizabeth's 50th wedding anniversary, stand on Pennsylvania Avenue by a statue of John Witherspoon, who signed the Declaration of Independence; at a party celebrating Paul Witherspoon's 60th birthday, Ralph E. Grim (left) and Witherspoon pay close attention to the proceedings.



plant contract to make synthetic rubber in Borger, Tex.

Witherspoon was among the group of technicians and engineers who designed, built and put in operation the plant that would make butadiene—one ingredient of the synthetic rubber—from butane.

In 1945 with the end of the war, Witherspoon returned to Oklahoma and met his future wife,

needed a better background if I wanted to progress in my career," Witherspoon says.

On to Urbana

That realization led him to the University of Kansas, where he earned a master's in petroleum engineering physics in 1951. Immediately upon graduating,

tions where there would be no escape of gas through an overlying caprock.

Since then, Witherspoon has worked on numerous large underground storage projects, developing between 20 and 25 projects all over Illinois, Indiana, Iowa and Minnesota.

While based in Urbana with the ISGS, Witherspoon furthered his

education by working on his Ph.D. at the University of Illinois. His roots in engineering showed in his choice of research area for doctoral dissertation, which, he says, was more engineering-based than geology.

"Dr. Ralph Grim, a very broad-minded individual, agreed to su-

pervise my thesis, which developed from work I'd done in petroleum engineering," Witherspoon remembers. "I had been studying the nature of Illinois crude oil. Using an ultracentrifuge that can operate at 60,000 RPM and was

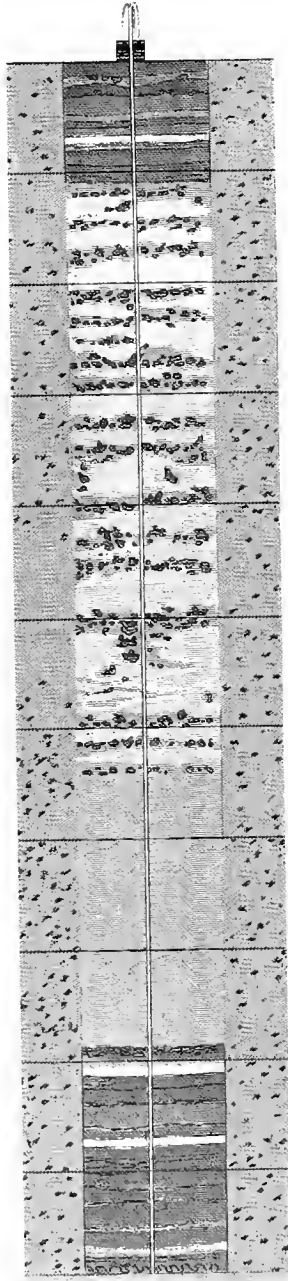
available at the Department of Chemistry, I spun out the colloidal material in Illinois crude. The material looked like asphalt and affects oil flow. I proved, using this special equipment, that asphalt exists as colloidal material."

As Witherspoon was completing his dissertation, the idea of an

A Different Kind of Learning Experience

In 1952, one of the first large aquifer storage projects that stored natural gas underground was being undertaken at Herscher, Illinois, near Chicago. The goal was to store natural gas in a naturally occurring underground aquifer and have it on hand during the winter months when demand was high.

Although the project was ultimately successful, the team had some difficulties to



overcome and mistakes to learn from.

"The company started pumping the gas in too fast and the pressure got too high," remembers Witherspoon. "This meant that the sandstone developed cracks and gas leaked out of the caprock into abandoned water wells. (By this point Herscher had already developed its own water supply and the residential wells were no longer used).

"Well, the water/gas mixture spewed out of the old wells just like fountains. Little boys discovered a great amusement in running down the back alleys and throwing matches at the wells, which erupted in fountains of flame.

"We all learned that you have to choose the right kind

of geologic structure to store gas. It can't leak or crack and it has to have a tight caprock."

Ultimately the problems were solved and the storage project has been very successful, but not before a company representative had to visit a woman keeping a lion in a cage in her living room. Although the woman lived too far away to have the leaks affect her, she was convinced her lion was ill because of tainted water. A member of the company was dispatched to visit with her and her lion and explain the situation. Quite unnerving to have your conversation stopped dead by a lion roaring in your ear.

academic career began to appeal to him.

"The six years at the ISGS gave me an idea of the nature of academia and between the time I spent at Kansas and at the University of Illinois, I became more and more academically inclined," says Witherspoon.

Wide-Ranging Career

As luck would have it, just at this point, a full professorship in mineral technology opened up at the University of California, Berkeley. Witherspoon successfully completed his thesis and showed up at Berkeley in 1957, where he's been ever since.

"I think the department was somewhat surprised that I found a great job that quickly," says Witherspoon with a laugh.

Over the last 40 years Witherspoon's research has spanned a wide range of topics, including the flow of ground water through fractured rocks, the migration of contaminated ground water through the subsurface, and the problem of isolating high level radioactive waste underground.

Witherspoon's curiosity, open-mindedness and ability to apply concepts from one field to another have helped change the direction of the field of hydrogeology, as interest moved toward fractured rock, one of his fields of expertise.

Hydrogeologists historically have been interested in producing water. That meant they looked for permeable materials, like sand,

rather than fractured rock, which is not always permeable. But by the 1970s interest arose within the discipline in the extraction and storage of heat and the storage of waste—especially radioactive waste. These needs required impermeable rocks, rather than permeable ones.

In 1973, Witherspoon began work at LBNL and helped establish the Earth Sciences division. One of the first activities of the division was to study the Stripa

granitic laboratory, and we demonstrated the need to get underground in order to study rock," says Witherspoon. "It has become one of the standard things you do and there are many other such labs today, though it's very expensive."

In "Retirement"

Although officially retired in 1989, Witherspoon has continued to work wherever his curiosity and

interest have led him.

He has traveled to Ukraine and Russia to help people there overcome the effects of radioactive fallout from Chernobyl. Last year, he was lecturing to specialists in China on the problems of developing a radioactive waste site in the Gobi Desert.

Witherspoon also is applying his expertise in fractured rock to the Yucca Mountain project, where the Department of Energy (DOE) plans to store more than 70,000 metric tons of high-level radioactive waste underground.

Witherspoon is currently serving on an advisory committee to review the work that DOE is doing to provide justification for selecting Yucca Mountain as a suitable storage site.

While Witherspoon doesn't know where his next project will lead him, whether back to fractured rock, on to radioactive soil or in an entirely new direction, one thing is certain. Another question will pose itself, and Witherspoon will be in hot pursuit of the answer.

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toward fractured rock,
one of his fields of expertise.

mine, an old iron ore mine in Sweden that had fractured granite surrounding the ore about 1,000 feet underground.

Witherspoon helped arrange a bi-lateral agreement that enabled the LBNL to conduct innovative research underground. By extending the tunnels a few hundred feet into the granite, his team conducted three years of research in one of the first large-scale rock laboratories in the world.

"This was the first underground

Alumni News

Obituaries

Newell E. Fogelberg, who attended the U. of I. and studied geology in 1939, died recently. He lived in Boulder, Co.

Hugh Gerard Walk, B.S. '41, M.S. '47, died in November, 1996. His wife, Marjorie, writes that he "suffered with cancer for a long while before his death, which was ultimately caused by a massive stroke." Walk taught geology at Marietta College in Ohio after graduating. He then worked 21 years for Texaco prior to starting a paleoconsulting company from which he retired in 1980. He is survived by his wife; three sons; one daughter; and their spouses; seven grandchildren; and four great-grandchildren.

Alan Dean Buck, B.S. '50, died April 22 in Muskogee, Okla. He was 72. Born in Waynesville, Ill., Buck served in the armed forces in Europe from 1943-46. He was em-

ployed by the U.S. Army Corps of Engineers as a research geologist for more than 35 years at Waterways Experiment Station. Buck, who also received a master's degree in materials science from Purdue University in 1964, received a number of awards, including Secretary of the Army Research and Study Fellowship, American Institute's Wason Medal for Research and election as a "Fellow" of the American Concrete Institute. Survivors include his wife, Anne Burster Buck; two sons, Andrew Dean Buck of Clearwater, Fl., and Christopher George Buck of Springerville Ariz.; one daughter, Jennifer Buck Proctor of Tulsa, Okla.; one brother, Gary Lee Buck of Urbana, Ill.; and seven grandchildren.

Cheri Chenoweth, B.S. '79, who lived in Urbana, died recently.

Alumni News is divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Thirties

Charles Jacob Hoke, B.S. '37, was awarded an honorary degree of doctor of humane letters from Lyon College in Batesville, Ark., on May 24. Hoke is a retired vice president and member of the board of directors of Murphy Oil Corporation, where he worked for 30 years. For the past 22 years he has served as a consultant. In 1995 he retired as trustee of Lyon College after serving 20 years.

Forties

Elmer Glendon Moore, B.S. '41, and his wife, Dorothy, recently bought a home at The Windsor, in Savoy, Ill. Moore worked for the U.S. Geological Survey and the Department of Defense before retiring.

Ed Bushman, B.S. '41, writes that he had a "full house over Easter week, with all six of our children, spouses and six grandchildren. The visit greatly cheered my wife, Louise, who is in a hospital bed in our living room overlooking the Pacific and its range of moods."

Fifties

William L. McKenzie, B.S. '50, has retired and is living in Winter Haven, Fla.

Edwin W. Tooker, Ph.D. '52, writes that he has retired after 42 years with the U.S.G.S. His career included work on industrial mineral ore deposits and managing a scientific program at both local and national levels. "I'm now a scientist emeritus completing geologic reports on mining districts and the structural geology of the Oquirrh Mountains, in Utah," he writes. Tooker also enjoys growing camellia, conducting family genealogy and traveling.

Willy Weeks, B.S. '51 and M.S. '53, recently returned to "Urbain" to attend his 50th high school reunion. He retired in June of 1996 from the Geophysical Institute after working on field projects in the polar regions for 41 years. He and his wife have moved to Portland, where he says his "accom-

modations are extremely comfortable and Portland is an outstanding city." He has set up an office in his basement where he still does a bit of consulting, he writes. In addition, he is editing Russian papers and is "about to start on a book which I think will probably be called "More Than Anyone Wants to Know About Sea Ice." E-mail address: willy@imagina.com

Michael Sweet, M.S. '57, has become a sedimentologist/development geologist with the Gulf of Mexico group of BP Exploration, Houston. He previously was with BP Exploration in Aberdeen, Scotland.

Donald O. Rimsnider, B.S. '58 and M.S. '59, retired from Chevron in 1984 and recently moved from New Orleans to Mandeville, LA.

Sixties

J. Cotter Tharin, B.S. '48 and Ph.D. '60, retired in 1996 from Hope College in Holland, Mich. Tharin was first invited to establish the geology department of Hope College when he was an assistant professor at Wesleyan University in Middletown, Conn. He was chair of the department for more than 20 years. In Holland he also has been active in local affairs, serving on the city council for 12 years and the planning commission for six years. "Like most retirees, we plan to travel, play more tennis, etc.," he writes. "We will likely continue living in Holland,



Do you recognize any of these people? This photo of Harold Wanless' "Geology of Illinois" field trip was taken at the Carter Oil Well (Southern Illinois) in 1941. Here's a hint: Ed Bushman is in the hat and checked shirt.

Mich., spending the winter months elsewhere." E-mail address: tharin@juno.com

Marion E. Bickford, M.S. '58 and Ph.D. '60, retired from Syracuse University in May, 1997, where she is now both professor emerita and research professor. So, in spite of her retirement, she continues to conduct full-time research and supervise one master's and one doctoral student. She received a "Chancellor's Citation for Academic Excellence," from Syracuse University last April. E-mail address: mebickfo@mailbox.syr.edu

Seventies

Thomas W. Perkins, B.S. '72, writes that in March he won the Occidental President's award for generating the prospects which led to the discovery of more than 10 trillion cubic feet of gas in Irian Jaya, Indonesia. He is currently senior geological advisor at Occidental Petroleum ("same rank for 12 years," he writes) where he is involved in Middle East exploration. Perkins also wants to note that Dr. Ralph Langenheim played the greatest role in his training as a geologist. E-mail address: tom_perkins@oxy.com

Neil Whitehead, M.S. '76, has moved from New Mexico to Littleton, Co., where he is a consulting geologist.

Pat Maas, B.S. '77, continues to work as senior processing geophysicist for Western Geophysical,

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

a part of Western Atlas International. She analyzes, processes and supervises processing of geophysical seismic data for oil exploration. "For the last year, I have been dedicated to reprocessing seismic data of various vintages from the Jenein area in extreme southern Tunisia. This particular data area is extremely difficult to deal with for several reasons, the main one being that it is thick surface sand desert with shifting dunes that can range anywhere from 15 to 70 meters in height. It is absolutely essential to use refraction statics in situations such as this to obtain any reasonable sort of resolution from the data."

"When I'm not busy with my career (ha!!), I'm usually chasing after my twin daughters, Amy and Allison, who are now six years old. My husband, Larry, a geology graduate of Texas A&M, is a database administrator for Schlumberger. Email address: patricia.maas@wg.waii.com

Eighties

Alison Hodge Lecouris, B.S. '83, is working as the oracle database administrator for the Illinois State Geological Survey, where she has been a computer programmer for 10 years. She has two "adorable" children, seven-year-old Jeff and three-year-old Jon.

Patrice A. Hauck, B.S. '83, is an attorney and sales rep for Merchants' Market, in Cole Bay, Netherlands Antilles. She writes that she's been enjoying "adventure, debauchery, cash flow ... last but certainly not least, sailing!"

Grant Olson, B.S. '81 and DVM '87, works at the Door County

Veterinary Associates as a farm animal veterinarian. "I went to Alaska recently and saw all those glacial geological formations in real life that I thought Hilt Johnson was just fabricating in class." Olson also wonders, "Where in the heck is Steve Greb???"

Alan Singleton, B.S. '88 and J.D. '91, is an attorney at Webber and Thies, P.C., in Urbana. He and his wife have two children, Heather (two years old) and Jacob, who was just born February 10.

Nineties

Brian Phillips, Ph.D. '90, and his wife, Katherine, had a baby July 2. His name is Thomas Calvin Phillips and he weighed 6 pounds at birth. Brian writes, "true to these times, I am in charge of changing baby, feeding mom, and assorted household maintenance. We will be staying close to home for a few weeks but hope to introduce Thomas to everyone in the coming weeks, months, and years."

Scott Wilkerson, Ph.D. '91, and his wife, Beth, had a baby boy August 3. His name is Zachary Marvin Wilkerson. Scott writes that "Zach was 22 inches long at birth and weighed in at 8 lbs 8.5 oz. Mom and baby are doing fine." Scott is on the faculty at DePauw University and is an adjunct professor in the University of Illinois Geology Department.

Fredrick D. Siewers, Ph.D. '95, and his wife, Helen, had a baby girl Anna Katherine, in December 1996. Fred teaches at Rock Valley College in Rockford, Ill.

Tim Paulsen, Ph.D. '96, will embark soon on a research expedition to Antarctica. He is currently a post-doctoral student at the Byrd Polar Research Institute.

Theresa L. Croak, B.S. '96, is currently modeling nuclear waste glass dissolution at Argonne National Laboratory. She plans to return to the University of Illinois this fall and complete her master's degree in environmental engineering. Croak specializes in environmental systems and will be teaching CE292 (an engineering design and optimization course) for the 97/98 academic year. She urges other former students to "write about their current whereabouts."

Anne M. Estandarte, B.S. '96, is living in Orland Park, Ill., and working for Sidley & Austin law firm in Chicago as a legal assistant for the Insurance, Product Liability and Malpractice Law Group. "I primarily work for one client on all their asbestos cases across the US," she writes. She also notes that on Nov. 1, 1997, she and Earl J. Bonovich (ENG '96 UIUC) will be married.

REMINDER

You can send your update for the

Alumni News via e-mail:

geology@uiuc.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; e-mail geology@uiuc.edu.

Name _____ Response date _____

Home address _____ Office address _____
(indicate if changed)

Home phone _____ Office phone _____

E-mail _____

Degrees from Illinois (with year) _____ Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
Stamp
Here

Editor, *GeoSciences*
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Geosciences

**University of Illinois
at Urbana-Champaign**



**Department of Geology
Alumni Newsletter
Spring 1998**

GeoSciences

Department of Geology Alumni Newsletter Spring 1998



Seeing is Believing:

Participants in the 315/415 field trip to Bonaire, Netherlands Antilles, analyse the Goto Mere outcrop in Washington-Slagbaai National Park for patterns and fabrics of Miocene dolomitization events in foreereef limestones of the Seroe Dumi Formation.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and spring of each year.

Department Head: Jay Bass; **Assistant to the Head:** Peter A. Michalove;
Editor: Deborah Aronson; **Production:** LAS Office of Publications;
Administrative Secretary: Terri George

<http://www.geology.uiuc.edu/>

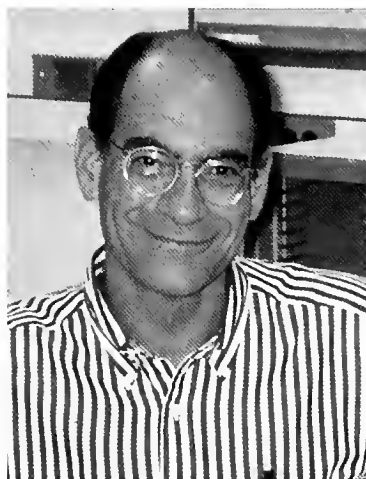
From the Department Head

Dear Alumni,

Having just completed my first semester as head of the Department of Geology, I am delighted to have had the opportunity to meet and correspond with many of you from across the country. This is certainly one of the most rewarding aspects of my position. I am especially pleased to see your enthusiasm and level of commitment to geology at Illinois, and I look forward to seeing and hearing from many more of you. We are hoping that some of you will be able to visit your old department and attend the annual awards banquet this May. The banquet is being combined with our annual GeoThrust meeting, so it is guaranteed that some of our alums will be here. Please feel welcome to take this opportunity to reconnect with old friends, meet the new faces in our department, visit with students, and celebrate the accomplishments of our alums and current students. This will be an annual "mini homecoming," and I hope you can make it.

I am glad to report that we are very busy working on several projects that will build on the strengths of our department and continue to increase its profile on campus. This semester our introductory course, Geology 100, has a record enrollment of 950 students. Now, close to 4,000 students enroll in geology courses each year! In addition, the number of geology majors has doubled in the past few years.

To serve this many students, and help with our other department projects, I appointed Professor Steve Marshak as the associate



Jay D. Bass

head. Steve is doing a great job with a variety of departmental duties.

Our new faculty members, Tom Johnson and Bruce Fouke, have settled in and are making their presence felt; Tom is having outstanding success obtaining funding to support his research program in hydrogeology and environmental geology. Meanwhile, Bruce just returned from leading our first-ever field trip to Bonaire, Netherlands Antilles. Bruce, 17 students, and four other faculty compared modern and ancient sedimentary environments during the first week of January. The trip was a huge success.

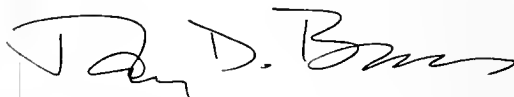
We are searching to fill the Ralph E. Grim Chair in mineralogy or sedimentary geology, which Richard Hay held until last June. We hope to find an outstanding senior scientist for that position. Ralph Grim's generous intellectual and financial support to the department will be remembered. We are also conducting a faculty search for a microbial geoscientist. This faculty position is partly funded by a grant from the

Campus Environmental Council. Our proposal to the Council was rated at the top in a competition, and will allow us to recruit a leading scientist at any level from assistant to full professor. These two new positions, as well as our two recent faculty additions, are an enormous opportunity for the department to define new directions and build strength. They also show the great faith that the campus has in our department. Our alumni support is recognized by the campus administration, and has made a real difference in our competition for scarce resources, such as new faculty lines.

In the midst of all this good news, I am saddened to tell you that Hilt Johnson passed away this last fall. He was a devoted alumnus, faculty member and an inspiration to several generations of students here. We will all miss Hilt. There is an article about him in this issue.

Again, I look forward to continuing contact with all of you. As usual, the geology department will host a reception at AAPG in Salt Lake City. It will be at the Marriott Hotel from 5:30 to 7:30; the room will be announced in the program and posted in the hotel. I hope to see you there.

Sincerely,



Jay D. Bass
Department Head

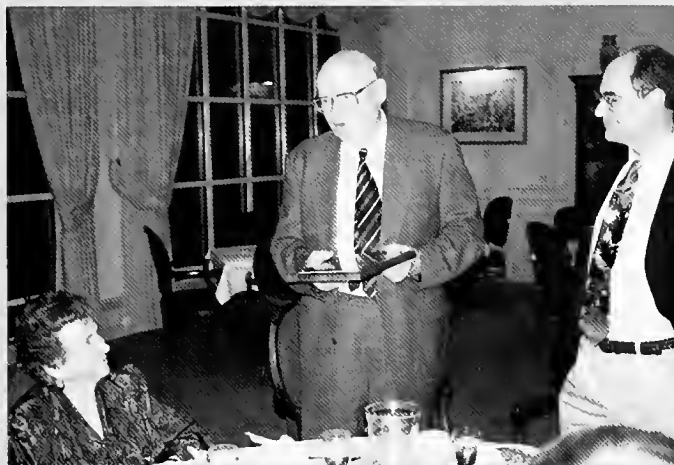
John D. Bredehoeft Named Outstanding Alumnus

John Bredehoeft, M.S. '57, Ph.D. '62, has been named the 1998 Outstanding Geology Alumnus. Bredehoeft, who served for 32 years with the U.S. Geological Survey, has received numerous awards in the course of his career. In 1997 alone, he received the Horton Medal from the American Geophysical Union, the Penrose Medal from the Geological Society of America and was voted a life member of the National Ground Water Association.

The geology department will honor Bredehoeft at a banquet on Friday, April 24, at 7 p.m. at the Champaign Country Club.

In 1995 Bredehoeft founded the Hydrodynamics Group which focuses broadly on environmental problems involving ground water.

The geology department will honor Bredehoeft at a banquet in his honor, which will be held Friday, April 24, at 7 p.m. at the Champaign Country Club. All alumni are cordially invited to attend this event. This is a good chance to catch up with classmates and meet other alumni, as well.



Paul Witherspoon, Ph.D. '57, received the alumni achievement award from Jay Bass at a banquet held in his honor September 19 at the Champaign Country Club.

If you are interested in attending, please mail your check—made payable to the Department of Geology—for \$22 per person to Terri George by April 18. If you have questions, you can call Terri at (217) 244-4066. The address is:

Terri George
University of Illinois
Department of Geology
245 Natural History Building
1301 W. Green St.
Urbana, Ill. 61801

Calling all Alumni!

The Geology Department will host a cocktail party at the spring meeting of the American Association of Petroleum Geologists. The party will be May 18 from 5:30-7:30 p.m. at the Marriott Hotel in Salt Lake City (where the convention is being held). The room number will be posted in the hotel.

Jean Daly Retires

Jean Daly, staff clerk at the Department of Geology, retired on December 24th after serving 11 years as business manager for the Hydrogeology Program. Among her special duties were serving as a liaison to a consortium of research sponsors and organizing the annual hydrogeology short course, attended by scientists from around the world.

The department honored Daly at a dinner event on December 16 at the Illini Union Colonial room. At the dinner Daly's friends and colleagues showered her with gifts and words of praise. "Several generations of graduate students, post-docs, and programmers, not to mention quite a few of the faculty owe her a special debt," said Craig Bethke, professor of geology. In her retirement, Daly is pursuing family and church activities.

Endowments: Opportunities For Named Giving

Great academic departments, such as the Department of Geology at the University of Illinois, can thrive only in a nurturing intellectual environment, one in which teaching, research and scholarship can flourish. Endowments, an idea popular since ancient times, can provide this environment, giving students and faculty the freedom to explore new avenues of study and the opportunity to push forward the frontiers of knowledge.

Endowments provide a means of permanent support to the department. Interest from an endowment is used for a specific purpose in the name of the donor and continues in perpetuity.

Endowments can be especially appealing because their scope is unlimited and can be tailored to support a wide range of people and programs. Possibilities are detailed below.

Named Endowed Chair

Endowed chairs, such as the department's Ralph E. Grim Chair, are the most prestigious positions the University can bestow on its faculty members. An endowment of \$1.5 million could create another chair and enable the department to attract a new faculty member of world-class stature.

Named Professorship

A named professorship allows the department to attract top-level faculty from around the world. An endowment of \$750,000 can establish the means of appointing a promising new professor. The income from an endowment of this level would be used to supplement an existing faculty position.

Named Visiting Professor

One way to keep our department strong is to have outstanding visiting professors who bring their expertise and unique

perspectives to the department. A gift of \$500,000 will enable us to bring a series of distinguished professionals here for one year each to share their expertise with students and faculty.

Named Fellowships and Assistantships

A gift of \$250,000 or more will establish a graduate fellowship that will help bring some of the brightest graduate students in the world to the department, as the Texas/ Louisiana Fellowship now does.

Named Research or Educational Endowment

An endowment to support research in a specific sub-discipline (such as sedimentology, geophysics, etc.) or to support modern instructional media such as equipment for computer visualization and modeling of geological processes in a three-dimensional format can be established for \$200,000.

Named Scholarships

These scholarships, such as the existing Midwest Scholarship Endowment, can be established with a gift of \$25,000. They are typically awarded on the basis of merit or need, and play an increasingly important role in attracting talented undergraduates from across the nation.

Named Lecture Series

For \$15,000 a donor can establish an annual lecture on a given area of interest or expertise by a distinguished scholar in that designated field, such as the existing Ralph Grim Lecture Series in clay mineralogy. The donor would gain recognition every year as the named lecture is publicized.

Endowments can be established by current giving or by testamentary giving (bequests). If you would like further information, contact the EA's Office of Development at (217) 533-1108. Endowments provide an important foundation for the future of the department and keep the University of Illinois Department of Geology at the forefront of excellence.

A "Thank You" From Fellowship Recipient

As the first recipient of the Texas/Louisiana Fellowship, I wanted to whole-heartedly thank the alumni who have made this award possible. I thought you might like to hear how that fellowship has positively affected both myself and the department. First of all, being recognized by my department is very encouraging, and the responsibility that comes with this award will motivate me for many years. The extra time created by this fellowship has enabled me to advance my research, which should also reflect favorably on the Department of Geology. Continuing to create fellowships like the

This type of fellowship works to help support this department and its graduate students, not just financially but psychologically.

Texas/Louisiana Fellowship will attract more high quality students to the University of Illinois. By receiving both recognition and support, these students are also encouraged to stay. Ultimately, the future successes of students benefiting from your generosity will continue to promote the image of the department and the university.

I had a chance to personally thank some of the people responsible for creating this fellowship, but I would like to thank everyone that contributed and to applaud your vision. This type of fellowship works to help support this department and its graduate students, not just financially but psychologically.

Again, my heartfelt thanks and greatest appreciation.

Sincerely,

Mike Brudzinski

.....
Brudzinski was featured in the Fall 1997 issue of Geosciences.



Okay everyone, say "coral reef." Members of the Geology field trip to Bonaire, Netherlands Antilles, stop long enough for a group photo, before going to examine the next outcrop.

Bequest Enables Student To Go On Field Trip

The Department of Geology recently received a bequest from the estate of Dorothy J. Gore, M.S. '52, that was designated to help female graduate students. That bequest has already enabled graduate student Yoshie Hagiwara to join a trip to Bonaire last January to study carbonate formation on coral reefs.

Hagiwara wanted very much to take the class field trip to Bonaire with 16 other students and five professors. However, she could not afford the entire cost of the trip. At the last minute, the department received Gore's bequest and was able to help Hagiwara take the trip.

"I didn't know what I was going to do," said Hagiwara. "The trip costs kept getting higher and higher and I wasn't prepared to pay the extra costs. When I heard about receiving this stipend I was pretty surprised, especially since it wasn't something I had applied for."

Hagiwara is completing her first year as a graduate student. Her adviser is Tom Anderson.

Graduate Student Cari Meyer Receives Grant

First-year graduate student Cari E. Meyer has received a grant from the American Federation of Mineralogical Societies Scholarship Foundation in recognition of her

outstanding academic achievements. She received her bachelor's degree from Western Illinois University.

In Memoriam:

Hilt Johnson

William Hilton (Hilt) Johnson, professor emeritus, died November 30 at his home in Las Cruces, N.M. He was 62. Many students have strong memories of Johnson and his famous field trips. Johnson retired in 1995 after 33 years as a faculty member. He received his bachelor's degree from Earlham College in Richmond, Ind., in 1956, where he was the president of his senior class.

Johnson received his master's degree and doctoral degrees in geology from the University of Illinois in 1961 and 1962, respectively. After receiving his doctorate, Johnson joined the department as a faculty member. He became the associate head of the department in 1991 and the acting head from 1993 to 1994. When he retired, Johnson and his wife, Joyce, moved to Las Cruces, N.M.

Johnson's research interests included quaternary stratigraphy, glacial geology and geomorphology. He wrote numerous professional papers, books and reports, and the section on the quaternary period and Pleistocene Epoch in the 15th edition of the *Encyclopaedia Britannica*.

Many alumni remember Johnson fondly from the geology field camp he taught in the Big Horn Mountains of Wyoming during the 1960s and '70s. He was the field camp director from 1964 - 1968 and 1976 - 1979. He also taught an introductory course on the geology of the national parks and monuments for non-science majors.

Johnson also was a research affiliate and con-



Hilt Johnson

sultant with the Illinois State Geological Survey (ISGS). The survey presented him a Lifetime Distinguished Achievement Award in 1995.

A longtime resident of Mahomet, IL, Johnson served on the board of trustees for the Sangamon Valley Public Water District at Mahomet for 15 years. He also organized the Canyon Association in the Las Alamedas neighborhood at Las Cruces.

Johnson is survived by his wife, Joyce; two sons, Eric Mark Johnson and Scott Webster Johnson; a daughter, Jennifer Johnson Krueger of Cincinnati; and three grandchildren.

A memorial service was held at the Unitarian Church in Las Cruces. Contributions can be made to the M. D. Anderson Cancer Center for Sarcoma Research, in care of Dr. S. Patel and

Dr. Peter Pisters, Box 77, 1515 Holcombe Blvd., Houston, Tex., 77030.

The University of Illinois geology department held a memorial service Feb. 12 at the Levis Center on campus. Johnson's family came from New Mexico and there was a large turnout of friends and colleagues. Speakers included Tom Anderson, Jay Bass and James Kirkpatrick from the geology department; Ardith Hansel, one of Johnson's colleagues at the ISGS; Edward Hajic, a former graduate student; Ivan E. Sherburn, Jerry Dewhirst and Barbara Mann, friends from Mahomet; and Johnson's daughter, Jennifer Johnson Krueger.



Wyoming field camp, 1965: from left, a student with Hilt Johnson, Dean Rogers' son, and the Dean.

From Coral Reefs To Martian Fossils, Fouke Hunts For Ancient Water Everywhere

Sedimentologist Bruce Fouke pursues an ephemeral subject, even for a geologist. He looks for traces of ancient seawater and groundwaters that long ago flowed through carbonate rocks. Fouke's high-resolution reconstructions of paleo-fluids, and their application to a variety of exciting new disciplines within the geosciences, are forging a new definition of sedimentology and stratigraphy for the geology department.

Sedimentary rocks are made up of grains of sediment, as well as small "cement" crystals in pore spaces between the grains. The cement crystals precipitate from water within the pores and bind the sediments into a solid rock. Therefore, the cement crystals represent a preserved record of water composition and fluid flow that remains after the waters are gone. Geochemically analyzing these cements and grains at a scale of several microns allows Fouke to reconstruct quantitatively the chemical composition of the waters that were present during and after the initial deposition of the sediments. The composition of post-depositional waters in the rock, and their resultant chemical changes, are also a major part of his work. By applying basic strati-

graphic principles at both the outcrop and microscopic scales, Fouke is able to establish grain and cement chemistries and their changes over time. He also uses



Professor Fouke holds a whiteboard for senior Kelcey Dalton at the Goto Mere outcrop on Bonaire, as she enthusiastically explains the geochemistry of low-temperature dolomitization in coral reef limestones.

several computer programs (that he wrote himself) to help model the relative dates within the sample, based on the chemical analyses. Fouke can then gain information such as whether the water was salty or fresh, or even hot or cold, and the time at which the water was in the rock.

"My work combines high-tech geochemical procedures like cathodoluminescence and mass spectrometry with classic geological concepts like 'the older deposits are at the bottom,'" says Fouke.

Circulation, or hydrology, is the trickiest element to reconstruct,

says Fouke. The first line of evidence is the distribution of crystals over a large area. For example, the spatial distribution of cements is a first order control on flow paths.

Fouke has several specialized tools for his detective work, the work horses for which are cathodoluminescence and microsampling.

Cathodoluminescence is a type of petrography in which visible light is emitted when electrons bombard a rock sample in a vacuum.

Cathodoluminescent images give Fouke a "road map" showing which parts of the cements are the oldest and which grains have been chemically altered.

Microsampling using dental drills is then completed within this crystal road map.

One of Fouke's projects, which is being completed in collaboration with Dr. Dennis Kolata at the Illinois State Geological Survey, involves reconstructing the composition and

paleoceanography of the ocean on the mid-continent in the Late Ordovician, some 450 million years ago. Fouke is particularly interested in a dramatic change that ceased marine sedimentation and caused calcite and other crystals to precipitate on the ocean floor, forming regionally distributed "hardgrounds."

"The burning question that we are still trying to answer is, were these hardgrounds formed above or below seawater?" says Fouke. "The integration of detailed field mapping, petrography and geochemistry across these

hardgrounds will allow us to better understand the waters present at the time of their formation."

Rebuilding Program

Fouke's arrival at the U of I is important for rebuilding the department's sedimentology program, says department head Jay Bass. "With the retirements of Albert Carozzi, Philip Sandberg, George Klein, Ralph Langenheim and, most recently, Richard Hay, the department's core of sedimentary and carbonate geology was decimated," says Bass. "We couldn't be more thrilled with Bruce's appointment. He is not only an extremely broad scientist with an interest in a diverse range of problems, but he is highly personable, congenial and always bubbling with enthusiasm. Bruce wasn't our first choice in that particular search—he was our only choice, and we had to compete hard to get him!"

The feeling is mutual. "I'm delighted, and indeed very thankful to be here. It's everything I've striven for at this stage in my career," says Fouke. "Jay Bass and the rest of the faculty have all made great efforts to make my entrance here a real success. They have laid a scientific and academic template for infinite potential, and I am thoroughly enjoying my new role as an active member of our department!"

Fouke's research has taken him from the coral reefs of the Caribbean to the search for life on Mars. He explains the wide range of his research projects by noting that he is a man of extremes (Not the least of which is his height. At 6'8" he occasionally bumps his head on the ceiling of his basement office). It's also a question of asking fundamental questions, notes Fouke.

The more fundamental the level at which you construct your scientific questions, the more universal the range of projects you can work on. In Fouke's case, anything related to ancient water can be addressed in his research.

Life on Other Planets

One of the most unusual applications of Fouke's research is the search for life on other planets. "There has been a revolution in our thinking about how to look for life on other planets. And much of this revolution was initiated here on the Illinois campus," says Fouke. "We've gone from looking for funny looking little green guys—not that they can't be out there!—to looking hard at microbes: primitive, early forms of life."

It has been suggested that the earliest microbial life, both on Earth and elsewhere, developed in a type of "extreme environment," where rapidly changing extreme environmental conditions would support a wide variety of microbial life. One such extreme environment is a hot spring, where subsurface waters erupt from the ground, cool, de-gas and rapidly precipitate minerals. Researchers have assumed that hot spring deposits of aragonite and calcite, called travertines, could entomb microbes in individual crystals.

But what would these preserved microbes, and the carbonate cement crystals in which they are entombed, look like? In an effort to answer this question, Fouke went to Mammoth Hot Springs in Yellowstone National Park as part of a NASA team to study how microfossils are preserved there. Although the team found abundant living microbial life on the surface, the ability to

identify microbial fossils—optically and chemically—is still in its infancy. Fouke hopes to continue this research in other travertine deposits. Results of Fouke's work will be used to interpret the fist-sized Martian meteorite (known as ALH84001) as well as to fine-tune strategies to search for fossilized extraterrestrial life forms on other planets.

Speaking of objects hurled at the Earth from outer space, Fouke has also become involved in the quest to understand—as he puts it—"how the dinosaurs got dinged." Fouke's work with Dr. Walter Alvarez has taken him to the Yucatan Peninsula where the impact of a giant comet or asteroid—thought to have caused the dinosaurs' extinction at the KT boundary—formed a crater five miles deep and 250 miles in diameter. That explosion, although kinetic and not nuclear, had the equivalent energy of an explosion 10,000 times the force of the world's entire nuclear arsenal, says Fouke, in awe. Fouke and Alvarez have searched for sediments launched from the crater at impact. The term they coined for this work was "ballistic sedimentology." The vapor clouds formed at impact were very hot and full of water and gases. As they cooled, particles stuck to the water droplets in the atmosphere and formed marble-sized pebbles. These "accretionary lapilli" are one of the few pieces of evidence of what happened in the atmosphere following the meteorite's impact. Fouke is currently conducting geochemical tests on these lapilli.

The Big Picture

His wide-ranging research projects belie the fact that Fouke loves teaching best of all.

"The big-picture plan I have had since my youth was to teach," says Fouke, "but I'm convinced you can't be a good teacher without being a really good researcher. I try to find a healthy balance between teaching and research, and I involve students heavily in everything I do."

Even as a child Fouke had a wide range of experiences, from attending civil rights rallies in

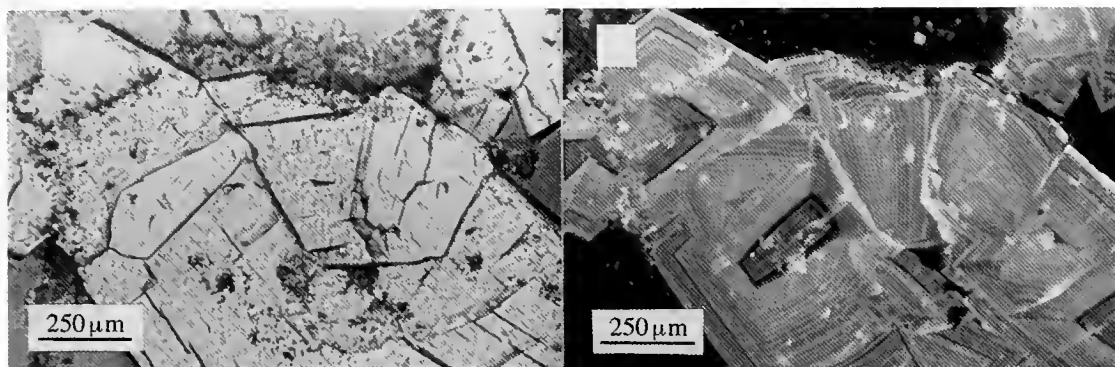
recounts Fouke. "I was having the time of my life. My only worry was to get enough to eat to keep going when baling hay."

Fouke attended Bradley University (Peoria, Illinois) on an engineering scholarship, and took an introductory geology course his junior year that changed his life. "After one lecture, the bells rang and angels sang," he says with his trademark 1,000-watt grin.

went to SUNY Stonybrook to learn about coral reef chemistry. During this phase he spent several years scuba diving in the Netherlands Antilles: Aruba, Bonaire and Curacao.

Fouke's first post-doctoral position was in Amsterdam and it involved extensive travel, from Ukraine and Russia to Spain, Italy and North Africa. His second post-doctoral position was at the

Learn more about Fouke's research at his Web site: <http://www.geology.uiuc.edu/HTML/Faculty/bfouke.html>



Paired photomicrographs of a thin section sample of dolomitized limestones from the Seroe Domi Formation in the Netherlands Antilles. The left photograph is of dolomite cement crystals observed under plane-light. The right photograph, taken in precisely the same position on the thin section as the left photograph, exhibits the same dolomite crystals under cathodoluminescence. The concentric crystal zonations record changes in the geochemical composition of formation waters that actively flowed through these limestones over 5.5 to 6.8 million years before present (age based on Sr isotope dating methods). Professor Fouke has recently completed construction of an integrated cathodoluminescence/microdrilling/video capture system to complete these types of analyses in his laboratory at the Geology Department.

Chicago with his parents to raising hogs in rural Iowa. Fouke's father, a United Methodist minister, was very active in politics and the civil rights movement. Fouke's parents took him and his two sisters to join in several of the pivotal protests during the 1960s. Living in inner city environments, Fouke learned at an early age what it was like to be a minority. Then, as a junior in high school, Fouke and his family moved to a town of 1,200 in central Iowa. When Fouke wasn't in school he was helping neighbors on their farms.

"I went from being a fairly smart street kid to raising hogs!"

Coming Home

It was coral reefs that first drew Fouke to geology. He was interested in how reefs formed and what kind of biological and chemical changes take place in reefs over time. At the University of Iowa, where he received a master's in geology in 1984, Fouke studied coral reef sediments in the Bahamas. At the University of Chicago, where he received a master's in paleobiology in 1986, Fouke looked at the biology of the coral reefs of Jamaica, as well as paleoecology. For his doctorate, which he received in 1993, Fouke

University of California, Berkeley, and his third was at NASA's Ames Research Center in California. After three post-doctoral positions in four years, Fouke admits he and his family (wife Ann, toddler Kaitlyn) are ready to settle down. They are expecting their second child this spring. And, in an interesting twist of history, Fouke's wife has strong family ties to Urbana. Ann's maternal great-grandfather (Dr. Oscar Leutwiler) was a professor of engineering at Illinois, and Ann's maternal grandparents met and dated while at Urbana High School. "We've come home!" says Fouke.

Fouke Inspires, Motivates Students

While addressing the geochemistry of dolomitization as part of his dissertation research, Bruce Fouke spent several months mapping on the island of Bonaire, Netherlands Antilles. Bonaire is renowned for its living coral reefs and sea life, and is an international model for its underwater national park. Bonaire provides a unique opportunity to compare and contrast modern environments of shallow lagoon and fore-reef sedimentation and geochemistry with equivalent Miocene through Pleistocene geological deposits.

This past January, Fouke took 17 students and five faculty members and instructors back to Bonaire for an eight-day field course on the geology of coral reefs (for more information about Bonaire, readers can go to the Web site <http://www.geology.uiuc.edu/HTML/BonaireFT/>)

Approximately half of the course was taught while snorkeling on the reefs in shallow nearshore marine environments surrounding the island, while the other half of the

course concentrated on land-based outcrops. The group's home for the trip was the Slagbaai plantation house, which was built in 1869 within what is now Washington-Slagbaai National Park. Special permission to use the Slagbaai facilities for teaching purposes was granted to our department by the Bonaire Stinapa National Park Foundation.

The geoscience topics covered during the field trip included a comparison of modern and ancient examples of three general topics: carbonate and siliciclastic depositional environments, including tropical benthic ecology; sedimentary geochemistry, diagenesis, and water-rock interaction histories, with emphasis on $^{87}\text{Sr}/^{86}\text{Sr}$ geochemistry and dolomitization; and groundwater geochemistry and hydrology. Other highlights included a tour of the Cargil solar salt

evaporating pans, and a look at the archaeology of the islands.

Illinois geology students made field trips to the Bahamas in the 1970s and '80s, but this is the first time the department has led a field trip to the southernmost Caribbean. A significant gift from the late Ruth G. Marshak helped students with their expenses for this field trip.

The Bonaire trip—and Fouke's part in it—already is gaining mythic status. "It was the best thing I've ever done," asserts senior Alex Glass. "Bruce is so well

rounded. He knows a lot, not just in various areas of geology and sedimentology, but also paleoecology, which is my interest," says Glass.

"Depending on who he's talking to, he goes into a certain mode, so he's good at meeting you at your level and meeting you at your area of

subspecialty. Bruce also is a great motivator. He pushed me to get scuba certified and I'm deeply indebted to him for that."

"Bruce is a great mentor because he has experienced everything and can offer great advice," says Jenny Jackson, a senior math major/geology minor who also went on the trip.

Fouke is gratified by the students' enthusiasm. "I was motivated to become a teacher in part because of all the great mentors I've had along the way," says Fouke. "Hopefully I can 'pass the torch' by providing career-changing and perspective-expanding experiences to my students. This was a great bunch of people," Fouke adds. "I've taught similar courses on various islands throughout the Caribbean, but there was magical sense about this group."



The island of Bonaire, Netherlands Antilles, is a part of the Aruba-La Blanquilla island archipelago off the northern coast of Venezuela.

Bonaire lies within a complex tectonic region at the strike-slip contact of the Caribbean and South American plates. As a result, Bonaire has experienced thousands of meters of uplift and erosion during the Neogene.



Garino Brings His Tenacity, Experiences To GeoThrust

When John Garino was an undergraduate he kept his nose to the grindstone and didn't take much time out for fun. And he still remembers Don Henderson's courses. "Dr. Henderson, boy! was he tough," remembers Garino with a grin. "He would give open book exams and you could bring all the books you wanted...but none of them would help!"

"John sure was a hard driver," remembers Bill Wilson, a former roommate and current business partner. "He got me to study a lot harder than I usually would, that's for sure. And he hasn't changed in that respect. John is tenacious and very organized. When he gets involved in something he really sticks with it."

Garino, B.S. '57, whose involvements now include the Geothrust committee, grew up in Coello, a small town in the mining country of southern Illinois. His parents had emigrated from Italy in the early 1920s.

Garino came to the University of Illinois and the Department of Geology to pursue a career in mining. As a 27-year-old undergraduate and war veteran, he brought a seriousness of purpose to his studies not all young people have.

"I worked hard and took lots of hours of classes and it was worth it," says Garino. "My college experience gave me the ability to do

things independently and gave me confidence in myself to do almost anything. I've had a good career, one I'm proud of."

Although Garino's career didn't



John Garino, above, with his wife, Carol, and at right in 1956.

follow the path he originally intended, he has no regrets. Garino signed up with Mobil Oil shortly after graduation ("my wife, Carol, was pregnant with our first child. There was no way I was going to take a job I was offered in Lima, Peru") and spent the bulk of his career in commercial marketing.

John and Carol, who retired from nursing management in 1988, have been married 41 years and have four children: three daughters and a son.

Enjoyed Sales

Garino sold Mobil Oil products to companies, such as White Pine Copper (a copper mining business), taconite mining businesses including U.S. Steel, and paper mills that needed lubricants and fuel for machinery. Garino and his team would assess the equipment and propose the best products to use. They primarily conducted engineering work, such as a technical analysis of wear rates on engines.

"I frankly enjoyed sales very, very much," says Garino. "I like going in to a company, making a proposal and convincing them it was the best thing for them to do. And then the next challenge was performing as we said we would, which we always did."

Garino spent half of his 30-year Mobil career in Milwaukee. Mobil was rated the number one market leader worldwide in commercial marketing, and Garino estimates his group had about 50% of the business in Wisconsin, the upper peninsula of Michigan, and Minnesota. Because of his activities and accomplishments, Garino became a Registered Professional Engineer, state of Wisconsin.

Following this success in Milwaukee, Mobil moved Garino to Detroit, where he spent about five years selling to the automotive

industry. He was in charge of Mobil's \$60 million commercial fuel and lube division in Michigan and Indiana. From there, Mobil moved Garino to Philadelphia where he managed the company's \$150 million commercial fuel and lube division for New England and much of the Atlantic seaboard. In 1988 Garino retired, and he and his wife returned to Milwaukee. At this point Garino also embarked on a second career that involved several business ventures related to his early mining interests.

Busy "Retirement"

One of Garino's first ventures upon retiring from Mobil involved joining a Milwaukee friend who had a company called TexPar Energy. That company's primary business was refining and selling the "bottom-of-the-barrel" residual fuel oil, but Garino helped them expand into selling military jet fuel to General Electric and McDonnell Douglas, the major jet-engine and airplane manufacturers in the country.

"I had the connections in this area, I knew who used what kind of fuel for engine testing," said Garino, of his role in the project.

Garino also went into business with Wilson. Their partnership began with some oil and gas drilling in Canada and the United States with a company called Quantum Energy. Garino sees this as a growing market, with the demand increasing indefinitely. As a Mobil employee, Garino was

prohibited from being involved in any drilling projects of his own.

"Once I left Mobil, I could get involved in drilling," says Garino. "So now I'm doing what I planned to do when I was in school."

Another company that includes Garino and Wilson, Merlin Energy Ltd., is reclaiming anthracite coal tips (slag piles) in Wales. Each tip is about two miles by 1/4 mile wide and 200-300 feet high. The

"I like going in to a company, making a proposal and convincing them it was the best thing for them to do. And then the next challenge was performing as we said we would, which we always did."

group currently owns four tips and is considering buying more, but it takes four years to reclaim a single pile. Garino says very few people are doing this type of reclamation project, which takes a lot of oversight to make a profit. This is the only reclamation project operating in southern Wales. The project, which began in April 1996, is already making a profit, says Garino.

"John's persistence in making sure things are run properly has made the Wales project a success," says Wilson. "He's really the one who oversees the project on a day-to-day basis, which is what it needs."

Another important role Garino played was finding other investors for both the drilling project and the reclamation project.

Garino's business interests and his love of travel often mesh nicely. He was able, for example, to combine a trip to England with a visit to the site in Wales when he and Wilson were contemplating the project. Just last year, Garino and his wife traveled to the UK, Italy, France and Switzerland. They are planning a big trip this fall to Turkey, Greece and Ukraine with friends from Mobil.

Garino, with his breadth of experience and tenacity, brings a fresh voice to the Geothrust committee.

"I don't know how much I'll contribute," says Garino, modestly-tanned from living six months a year in Arizona and fit from playing golf regularly—"but I believe in education and I appreciate the education I got at the

University of Illinois. Now it's time to give something back."

"John has been a staunch supporter of the University of Illinois and the geology department for a long time," says Morris "Brud" W. Leighton (B.S. '47 and co-chair of the Midwest Geothrust committee). "He is a real go-getter and entrepreneur and we appreciate the special perspective he brings to the Geothrust committee."

Graduate Student Joel Johnson Does “Best When Busy”

Graduate student Joel Johnson is most productive with a tightly packed schedule. Even now, during his last semester as a master’s student, he is ambivalent about not having to teach, as he has done every previous semester.

“It’s great to have the extra time to work on my thesis, but I miss some of the structure teaching put on my time,” says Johnson. “I

Duluth-Superior Symphony Orchestra.

“The time commitments of the symphony really helped me stay organized,” says Johnson. “Even though it was consuming, being in the symphony was very enjoyable and relaxing, and it especially kept me sane during hectic times at school.”

Johnson certainly lives by his creed “the busier you are the bet-

The Darland All-American award reflected Johnson’s leadership qualities, his well-rounded education and his strong moral character. The Eagle Scout is certain that he gained his work ethic from his parents and grandparents.

“Growing up with very hard-working parents, and grandparents nearby, I learned to always give my best effort and to see every project I start to completion,” he says.

Johnson also saw his father earn his own Ph.D. in 1991, one year before Johnson graduated from high school.

“My father has been very inspirational to me and seeing him go



Joel Johnson at the Grand Canyon during spring break 1997.

think being really busy keeps me going. Though, of course, an occasional break is nice,” he says with a laugh.

In college (University of Minnesota, Duluth), Johnson stayed busy by being a full-time student—majoring in geology, double minoring in chemistry and Spanish—while also playing string bass for the

ter you do.” He excelled in college and received numerous awards, including the Raymond Darland All-American Scholarship, the American Institute of Professional Geologists Grant for Leadership, and the University of Minnesota, Duluth, outstanding senior geology major, as well as two field camp scholarships.

through his doctoral degree really motivated me to go on with my education,” acknowledges Johnson.

Illinois Basin

For his master’s degree, Johnson, with adviser Steve Marshak, is examining a structure within the

Illinois basin. While the basin has been studied for decades, Johnson is looking specifically at a subsurface fold, known as the Du Quoin Monocline, in the south-central part of Illinois. By using geophysical well-logs and seismic data, Johnson is trying to determine the three-dimensional shape of the monocline, its structural configuration (i.e. the relationship of faults beneath and near the fold), and the tectonic evolution of the structure during the Late Devonian through Pennsylvanian periods.

Because it involves a subsurface feature, this project does not involve field work, but it does require analyzing huge amounts of data. Thanks to an immense amount of geophysical well-log data acquired and stored at the Illinois State Geological Survey (ISGS) and recently released seismic data from Mobil, also acquired by the ISGS, Johnson has plenty to work with.

"Having the support and resources of the ISGS has been wonderful," says Johnson. "Everyone there has been enthusiastic and very helpful with many aspects of my project and I can't thank them enough."

"The seismic data set will perhaps lead us to the most exciting discoveries in this area," says Johnson. "From it we should be able to determine the configuration of faults beneath the monocline and their relationship to other faults in the region."

Some of Johnson's research is being supported by a grant from the Mid-America Earthquake Center, a National Science Foundation-funded consortium that is researching the risk of earthquake activity in the region.

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Superb Leader

In the course of his master's degree research, Johnson's interests have shifted slightly, from structural geology to the effects of tectonics on sedimentation. Johnson credits his course work and field trips, as well as his adviser, with preparing him for the next phase of his career.

Marshak says of Johnson, "Joel is a superb leader, particularly at

field camp, where he was a teaching assistant. And it has been fun to watch the evolution of his interests as a graduate student."

"Everything has really fallen into place for me here," says Johnson. "Steve has been a great professor and adviser. A lot of

what I've learned about both teaching and research has come from watching Steve. His enthusiasm is key, but his ability to explain things in multiple ways also really helps students. He's also patient and seems to make time for students regardless of his busy schedule. You can tell he loves what he's doing."

Johnson first met Marshak at field camp when Johnson was an undergraduate.

"I could tell he was hard working, ambitious and enthusiastic. I knew I wanted to work with someone like that," says Johnson.

"The University of Illinois has really given me a lot and I feel very fortunate to have come here," says Johnson.

"Not everyone has the kind of guidance that I have had, both in graduate and under-

graduate school."

Johnson has the same enthusiasm for promoting geology, and science in general, that he admires in his own adviser.

"It's a fun experience to see people's eyes light up when they figure things out," says Johnson. "In field camp, for example, students started out projects completely flustered and confused, but by the end it was exciting to see

how far along each of them had come in such a short time."

Johnson says his strong structural background will serve him well as he moves on to a Ph.D. program.

"I think it is good to have strong understanding of structural geology when considering most geologic problems, especially those involving the effects of tectonics on sedimentation," he says. "I also think having a well-rounded background will help give me a broad perspective, which is needed when trying to solve complex geologic problems."

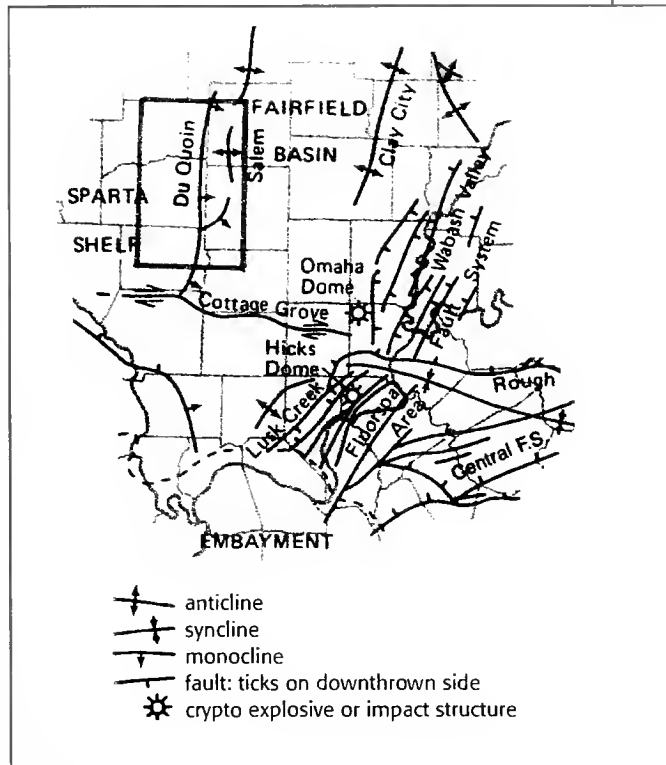
Setting Goals

After completing his master's degree this spring, Johnson plans to head west for a doctoral program. He'd like to experience what he calls "a different style of geology, with a different focus," and he'd like to be able to see outcrops and incorporate field work into his studies.

Ultimately, Johnson looks forward to finding an academic position.

"I've always been interested in teaching, from the very beginning," says Johnson, "and my role as a teaching assistant at Illinois has served to confirm that interest."

Another thing Johnson is looking forward to is playing string bass again. Because these instruments typically cost \$10,000, Johnson has always played a rented one and, consequently, hasn't played since 1996, when he left Duluth. However, he recently bought an old one for a pittance and is getting it refurbished. It



Structural features of the Illinois basin and adjacent areas. Johnson's study area is the boxed area located in south-central Illinois (from AAPG Memoir 51, Leighton et. al. 1991)

should be ready to play this spring.

"I can't wait to be able to play again," says Johnson. "It's a real stress reliever."

Johnson is focused on that ultimate goal and the steps in between. Knowing that more schooling lies ahead and that his girlfriend, Yen-Ying Chee, now

living in Minneapolis, will join him next year motivates him to keep working hard, from early in the morning to midnight most nights.

"Looking forward to the future keeps me focused on what I have to do to get there," he says.

Obituaries

FRANCES GRIM, wife of the late Professor Emeritus Ralph E. Grim, died last October. After her husband's death, she continued to be a friend of the department and stayed in touch with many people in the department.

WALLACE HAGAN, A.B. '35, M.S. '36, Ph.D. '42, of Lexington, Ky., died last July. He served as director and state geologist for Kentucky from 1958-1978. During his tenure, he initiated and completed a statewide aerial geologic mapping project in cooperation with the U.S. Geological Survey. This monumental program resulted in the publication of more than 700 detailed geologic maps, the first such state maps in the country. He was also well known for his activities as a petroleum geologist. Hagan was a lifetime member of the American Association of Stratigraphic Paleontologists.

ROBERT SHAVER, B.S. '47, M.S. '49, Ph.D. '51, died last September. The week before his death from a massive heart attack, Shaver led several petroleum-industry geologists on a five-day field trip through the reef exposures in northern Illinois and Ohio. Shaver worked since 1956 as head of the geology section in the Indiana State Geological Survey in Bloomington and associate professor in the Indiana University Department of Geology. He served as editor of the *Journal of Paleontology* from 1964-69 and in 1976 was elected president of SEPM. His major scientific contributions were his studies of the Silurian reefal growth patterns and the paleogeography of the eastern interior region. He has written more than 100 articles.

Shaver was a veteran of WWII and was a navigator on many missions over Nazi Germany. In recognition of his heroism he was awarded the Distinguished Flying Medal. His first wife, Beryl, pre-deceased him. He is survived by their four children: Joan, Mark, Jill and Bruce; and by his second wife, Sue Shaver, of Bloomington.

WAYNE A. PRYOR, M.S. '54, died May 12, 1997, after a long illness. He served as an associate geohydrologist at the Illinois Geological Survey (1953-1959), and as exploration geologist/

sedimentologist at Gulf Research and Development Corp. in Pittsburgh, Penn., (1959-1965) before serving as professor of geology at the University of Cincinnati for 33 years. Pryor's research and 60 journal papers focused on sedimentology and stratigraphy. He received numerous awards in his career, including being an AAPG Distinguished Lecturer in 1982-83, receiving the "1960 Best Paper at the Convention Award" from the SEPM, receiving a Fulbright Professorship in Germany (1968-69), and receiving the first University of Cincinnati Department of Geology Excellence in Teaching Award in 1997.

Pryor also was the founding president of the Great Lakes SEPM Section (1971-72), and was elected the national SEPM Secretary-Treasurer (1974-1976). He was a member of the AAPG, SEPM, International Association of Sedimentologists, and the Kentucky Oil and Gas Association and was a registered petroleum geologist. Pryor and his wife established the Wayne A. Pryor and Mary Lou Motl Fellowship Fund, administered through the Greater Cincinnati Foundation, to support junior and senior geology students.

Pryor is survived by his wife and two children, Heidi L. Pryor and Michael W. Pryor (both living in Cincinnati).

This information was provided by George D. Klein.

JAMES BREDAR, who attended the geology department in the late 1950s, died last August. He was 65. Bredar was a geologist and partner in TenJab Oil and Gas for 36 years in Owensboro, Ky. While at the university, Bredar was captain of the basketball team and an All American. After completing his undergraduate degree, Bredar served as assistant basketball coach under Harry Coombs, while pursuing a master's degree.

He is survived by his wife, Wilma Allen; a son, James Bredar, of Danville, Ill.; a daughter, Carrie Oliver, of Owensboro; his mother of Salem; a brother, Frank Bredar, of Salem; and a sister, Ann Woods, of Salem. Memorial contributions may be made to the American Cancer Society and Hospice.

Alumni News

Alumni News is divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Thirties

Willis M. "Bill" Decker, B.S. '39, retired from the exploration department of Cities Service Oil Co. (which was bought by Occidental Petroleum) in 1978 and from Jet Oil Co. (where he was vice president of exploration) in 1986. He attended a reunion last fall of VP/VPB 23, a Navy Patrol Bomber squadron. He was in the VPB 23 from 1943-45, serving in both the South Pacific and Central Pacific. "In one six-month period our squadron (made up of 15 planes and 18 crews of nine men each) helped pick up 278 men downed by enemy fire," he says. His daughters Donna (born while he was in the South Pacific), and Kay, and his wife also attended the reunion.

Last December they took a Caribbean Cruise to celebrate his 82nd birthday, his wife's 80th birthday and their 55th wedding anniversary.

Forties

Howard Schwalb, B.S. '49, writes that he is "alive and happy in Green Valley, Ariz." Schwalb is a geologist emeritus with the Illinois State Geological Survey.

Fifties

Russell B. Lennon, M.S. '57, retired from Shell Oil Co. after 33 years as a development geologist.

During that time he spent four years teaching in Shell's training schools and taught evening classes at the University of Houston's graduate petroleum geology program. Now he spends much of his time birding, traveling and doing volunteer work.

Carl G. Davis, B.S. '59, retired from Danville Area Community College in May of 1997 and continues to teach there part time in Earth Science and Physical Science. His daughter, Elizabeth, is a senior majoring in English at the University of Illinois. One of Davis' hobbies is radios and he had an article published in a book of crystal set projects. "The 'crystal' used is galena (this was the first radio receiver, circa 1910), so it's still in the geology area!" he writes. Davis also is writing an article for the Danville Historical Society on the U.S. Polar Bear division that fought in the Russian Civil War. His father was a member of that outfit. Finally, he is working on a project tentatively called "Pictorial Geology of Vermilion Co." It will concentrate on coal beds, cyclothems and the Pleistocene.

Sixties

Donald J. Colquhoun, Ph.D. '60, is now Distinguished Emeritus Professor of Geology and Marine Science at the University of South Carolina. He retired last July after 37 years, during which time he

had many students and numerous publications. He is still assisting on several Ph.D. committees. He can be reached at d.colquhoun@worldnet.att.net

Daniel A Textoris, Ph.D. '63, is considering retiring from the University of North Carolina, Chapel Hill, at the end of the spring semester. He'll teach environmental geology once or twice a year in a phase-out program. His wife, Linda, will continue in her home-health profession for two more years, until she is 62. "Then, stay in Chapel Hill? Move to L.A., Portland, Ore., or Rockville, Md., where all three children live with spouses?" Stay tuned!

Dianne (Capritta) Juchimek, B.S. '65, retired in November after more than 30 years with the State University of New York. Her last position was coordinator of Collection Development for the campus libraries.

Douglas Mose, B.S. '65, is professor of environmental science at George Mason University in Fairfax, Va., an expert witness for law firms, and an environmental scientist for northern Virginia testing companies.

Seventies

Jim Granath, B.S. '71, M.S. '73, has been appointed regional and case studies publication subcommittee chair for American Association of Petroleum Geologists. He will

GeoSciences is for alumni and largely about alumni. Please take the time to complete and return the information form at the end of this issue. Just as you like to read about classmates and other alumni, they'd like to know the latest about you. Your news is important to them and to us in the Department. Send along a recent photo, too, but let us know if you want it returned.

Egg On Our Faces

BOY! Are we embarrassed! Marion Bickford did not undergo a sex-change operation. Rather, due to a major editorial oversight, we misidentified Marion as a woman. Many astute readers wrote to correct us. Among the notes we received was one from Douglas Mose, B.S. '65, of Fairfax, Va., who writes: "please note that Marion (Pat) Bickford is a successful male scientist (he is "under-described" in your commentary). Were I you, I would run a feature article on HIM, as his professional record speaks well for the university where he got his Ph.D."

Many others wrote straight to Pat. A few are included below.

From: bob simmonds
<simmonds@olympus.net>
Subject: Is that you, Pat?!

Just opened the latest alum newsletter from Geology-U. of Ill., and learned that Marion Bickford "she retired" and despite "her retirement"...is this another person? has there been a sex change?

From: james c tharin
<tharin@juno.com>

Did the operation hurt much?!
-Cotter

kane with our cats, dogs and horses. I'd love to hear from some of my classmates."

David Watso, M.S. '88, is a senior geologist/3-D workstation specialist with Subsurface Consultants & Associates of Lafayette, La. He was previously a consultant for the same company.

Nineties

Christopher A. Hedlund, B.S. '90, is living and working in Houston, Tx., where he conducts structural geology research for the Shell Exploration and Production Technology Co. His research includes fault mapping, dating of deformation with growth strata and cross section restoration. He can be reached at hedlund@shellus.com

Melinda Ann Legg, M.S. '94, and **Robert F. Ylagan**, Ph.D. '96, were married September 7, 1997. The couple lives at 3720 West Alabama #2305, Houston, Tex. 77027. They can be reached at mbylagan@worldnet.att.net.

Wendy (Gill) Czerwinski, M.S. '95, and her husband, Richard, are the proud parents of Rachel Victoria, born on November 10. At birth she weighed in at 7 lbs., 5.6 oz. All members of the Czerwinski family are doing well. They live in Burlington, Mass., and can be reached through Richard's e-mail at rnc@ll.mit.edu.

Matthew Haverty, B.S. '96, is teaching physics and earth science at Amphitheater High School in Tucson, Ariz., and coaching basketball for seventh graders at a middle school.

hold that position until 1999.

Granath also works for the Conoco Advance Exploration Organization, the international new ventures group for Conoco. He has been doing structure and tectonics project work since 1993.

John M. (Jack) Sharp, M.S. '74, Ph.D. '74, is the Chevron Centennial Professor of Geology at the University of Texas at Austin. He writes that his oldest daughter, Katie, received her B.S. in hydrogeology from Colorado State and "occasionally joins the old man at conventions to improve his image."

Neil H. Whitehead III, M.S. '76, and his wife, Ann W. Whitehead, have become consulting geologists in Littleton, Colo. They were previously consulting geologists in Socorro, N.M.

John Mitchler, B.S. '78, has signed a contract to publish a guidebook to hiking the highest point in each of Colorado's 63 counties. On Sept. 14, 1996, he was the first person to hike or climb to each point. Since then two other people

have accomplished that feat. John also mentions that he has been to the high point of 14 Illinois counties and helped research the location of the high point for all 102 counties. "If anyone is wondering, Champaign County's high point is northwest of town on Yankee Ridge by the radio tower just north of the interstate!"

Eighties

Valla D. Earl, B.S. '84, is working for the Washington State Department of Transportation Construction as a design engineer. Most recently they completed the second and third design phase of an \$18 million "frost free" roadway that involved interesting geology. They also finished construction of several climbing lanes through gorgeous terrain. "I consider myself blessed to work in such a beautiful part of the country," she writes. Valla also recently was promoted into a management position and received her professional engineer's license in 1995. She has two sons, Jonathon (7) and Daniel (6). "We live in rural Spo-

REMINDER

You can send your update for the Alumni News via e-mail:
geology@uiuc.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; e-mail geology@uiuc.edu.

Name _____

Response date _____

Home address _____
(indicate if changed)

Office address _____

Home phone _____

Office phone _____

E-mail _____

Degrees from Illinois (with year) _____

Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

Place
Stamp
Here

Editor, *GeoSciences*
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Urbana, IL 61801-2999

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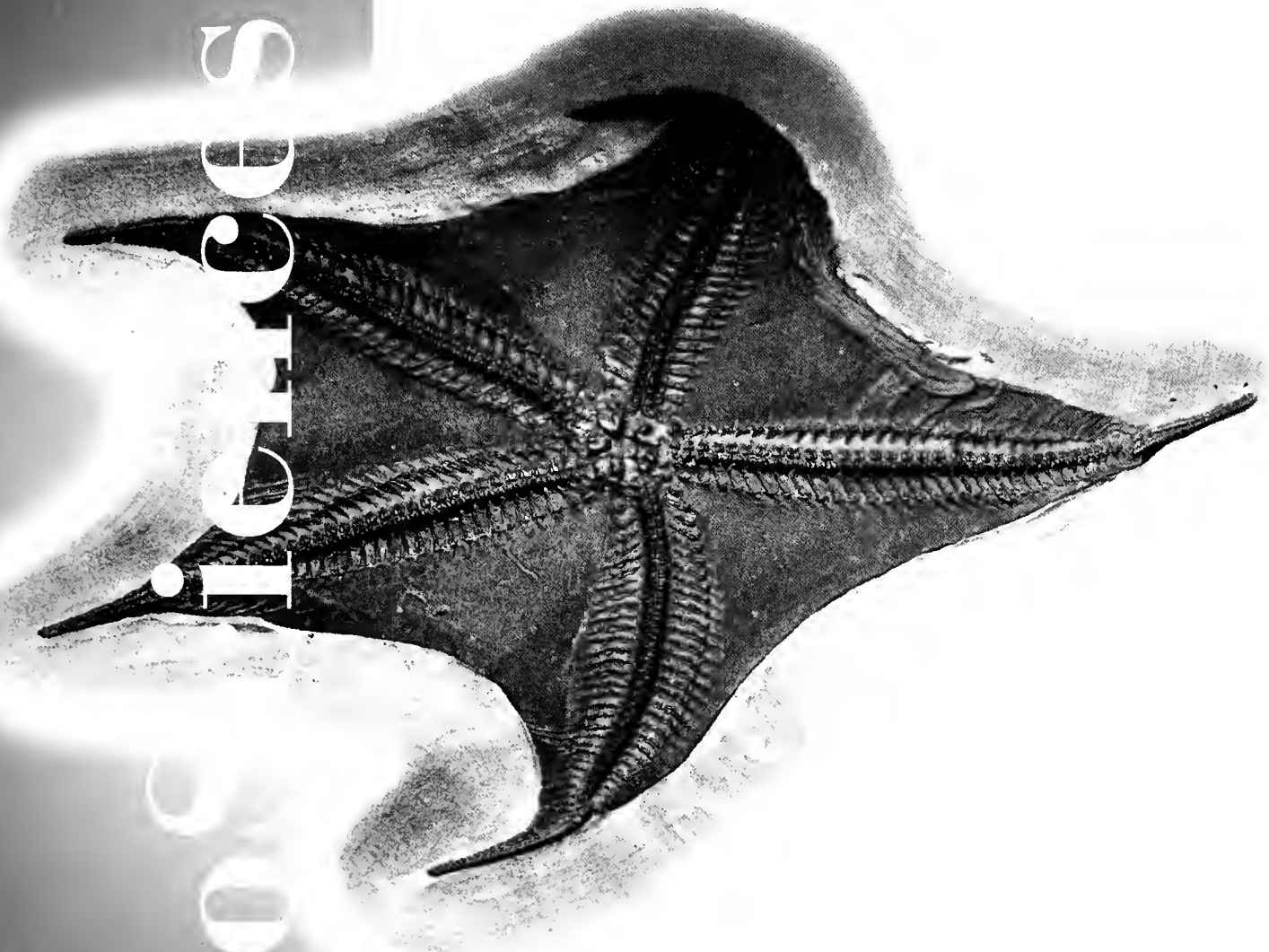
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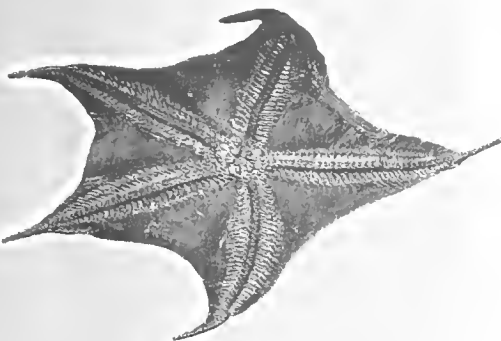
**Department of Geology
Alumni Newsletter
Fall 1998**



GeoSciences

Department of Geology Alumni Newsletter

Fall 1998



About Our Cover:

This is one of the most famous images of a fossilized brittle star, a member of the stelleroid fauna. Undergraduate Alex Glass has developed a passion for these marine creatures after studying with Professor Dan Blake. For more about Glass, see the story on page 9.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and spring of each year.

Department Head: Jay Bass; **Assistant to the Head:** Peter A. Michalove;
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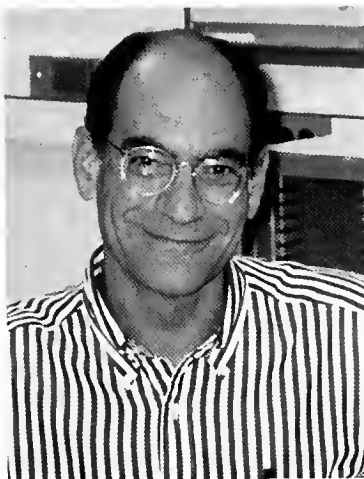
<http://www.geology.uiuc.edu/>

From the Department Head

Dear Geology Alumni.

As I take stock of my first year as department head, one of the most pleasant parts of the job has been the opportunity to meet so many of you throughout the country. At the AAPG meeting in Salt Lake City last spring, I was able to meet a number of our alumni, and I look forward to future opportunities to get to know you. We will continue to have alumni gatherings at professional meetings and other events around the country because your ideas and experience are a crucial asset to the success of the department.

We have ambitious plans for the department again this year. Our enrollments in geology courses remain high, and our department has developed a reputation for offering some of the highest quality teaching on campus. For the first time in many years, we offered summer courses this year (Planet Earth and History of Life) and they both had excellent enrollments, especially for new summer offerings. We are continuing to build a relationship with the College of Education on campus and the public schools in the community. Also, we are initiating two searches this semester for additional faculty: one is focused on geo-microbiology (a growing environmental field), and one is a broader search in several areas of "hard rock" geology (petrology/geochemistry/ geophysics). This is a truly exciting time of growth.



Jay D. Bass

We have ambitious plans for the department again this year. Our enrollments in geology courses remain high, and our department has developed a reputation for offering some of the highest quality teaching on campus.

With all this activity, we remain focused on our main message of providing geology students with an education that is second to none. In addition to a firm background in all the basic geologic areas, we are putting more emphasis on involving our undergraduates in research. These undergraduate research experiences are an important way of letting the students apply all their

classroom knowledge toward the solution of real geologic problems. In addition it gives the students the opportunity to present themselves at professional meetings, and it gives them a look at what lies ahead of them as they start their careers as geologists.

A research experience also sets our students apart from the crowd when it comes time to apply for a job or graduate school. We have many students who are distinguishing themselves in the research arena, and I hope you'll enjoy reading about the activities

of a few of our outstanding undergraduates in this issue. We are very proud of all they are accomplishing, and believe they are destined to keep up the tradition of achievement that so many of our past graduates have established.

To keep up with developments in the department, be sure to visit our web page at <http://www.geology.uiuc.edu/>. If you visit the University, make sure to stop by and visit the Natural History Building to see

what's going on in the department. We'd love to see you!

Sincerely,

A handwritten signature of Jay D. Bass in dark ink.

Jay D. Bass
Department Head

Check Us Out—<http://www.geology.uiuc.edu/>

Mid-America Earthquake Center Established

Members of the Geology Department have joined a multi-disciplinary effort based at the University of Illinois focused on reducing losses from earthquakes in the central and eastern United States. Funded by the National Science Foundation (NSF), the project is called the Mid-America Earthquake Center. This is the first coordinated effort of its kind to focus directly on engineering for earthquakes in the Midwest and is supported with \$2 million per year for five years from the NSF.

Daniel Abrams, professor of civil engineering, is director of the program. Professor Wang-Ping Chen, who has expertise in the study of intraplate tectonics, has been helping in the planning of the center. Professor Steve Marshak and John McBride, of the Illinois State Geological Survey, also have been involved. There are a total of seven universities involved in the Mid-America Earthquake Center. In addition to



Dylan Canavan and Aubrey Zerkle stand in front of the geology display at the annual Geology Department Open House.

Illinois, those are Georgia Institute of Technology, Texas A & M University, University of Memphis, Washington University in St. Louis, St. Louis University and Massachusetts Institute of Technology.

Sugar Creek Saga

"Sugar Creek Saga: Chronicles of a Petroleum Geologist," is an autobiography by Harold Scott, professor emeritus, that also examines the role of petroleum products in the dramatic changes that have taken place from the 1900s to the present. Copies of the book are available from the department for \$15. All the proceeds go to the Harold Scott Fellowship Fund for student support. Send your orders to Sugar Creek Saga, University of Illinois Department of Geology, 245 Natural History Building, 1301 W. Green Street, Urbana, IL 61801.

Geology Open House

For the first time, the Geology Department joined the College of Engineering for its annual open house for high school students. The event, which attracts thousands from area high schools, often brought by teachers, was held April 13 and 14 in the Newmark Civil Engineering Building. Students from the department set up several displays, including ones on field geology, luminescent materials, the Bonaire field trip (read article in the last Geosciences issue), a virtual field trip to Hawaiian volcanoes, earthquakes and dinosaurs and various posters on thesis work.

Faculty members Bruce Fouke and Steve Hurst helped oversee the open house and were also on hand to answer questions and promote the department. The geology department was the only non-engineering department included in the open house.

New Petroleum Geology Course Offered. Augmented by Software Grant

Steve Marshak is coordinating a new department course in petroleum geology this fall. The course, co-taught with Hannes Leetaru, Ph.D. '97, of the Illinois State Geological Survey (ISGS) is an opportunity for graduate students to learn geosciences applications in the petroleum industry. Marshak will augment the course by inviting several guest lecturers from the ISGS and the department to talk about their specific areas of expertise within the petroleum geology field.

Leetaru will be primarily responsible for creating hands-on applications dealing with problem sets. "We want to make this a practical course so that those who finish it will actually know what they would be doing in a career as a petroleum geologist," he says. "It's hard to understand what petroleum geologists do without having had a course like this."

The course also will use Landmark Company software to interpret and display subsurface data.



Steve Marshak (with beard) and Hannes Leetaru look at a cross section of an oil field in preparation for the new petroleum geology course.

Way to Go!



Barbara Elmore, a secretary in the department responsible for all student affairs, has been selected to receive a Chancellor's Distinguished Staff Award. This award is given annually to only a few staff members campus-wide. Great work Barb!

pret and display subsurface data. The Landmark software is part of a three-year renewable grant from the company to the ISGS and the department. Leetaru is the principal investigator on the grant.

"The survey and the department have been growing closer together over the last several years, and I saw this grant as another way to promote that collegiality," says Leetaru.

The grant includes more than \$300,000 worth of computer software that is primarily used for the petroleum industry. Landmark, one of the premier computer software developers for geology in general and petroleum geology in particular, is based in Houston, Tex. The software enables students and faculty to

Stephen P. Altaner was one of four faculty members on campus to receive the William F. Prokasy Award for Distinguished Teaching from the College of Liberal Arts and Sciences.

In the past academic year, eight people in the Geology Department have been included in the campus-wide Incomplete List of Teachers Rated as Excellent. They are professors **Steve Altaner, Bruce Fouke** and **Steve Marshak**; undergraduate **Alex Glass**; graduate students **Judy Becker, Michael Brudzinski, Michael Harrison** and **Joel Johnson**; and visiting lab teaching specialists **Dave Finkelstein** and **Mindy Tidrick**.

model geologic processes in three dimensions, including interpreting data concerning geologic cross sections, mapping, three-dimensional modeling and the better interpretation of seismic data used in subsurface mapping.

Possible recruits for the class of '16?

Graduate student Chris McGarry and his wife, Becky, have a new daughter, Amanda Michele McGarry. Amanda was born June 2 and weighed 8 lb. 9 oz upon arrival.

Professor Bruce Fouke and his wife, Ann, also have a new addition to their family: Kyle William Fouke. Kyle was born March 24 and weighed 8 lbs. 10 oz. At three months he was already 19 pounds. Fouke says, "I had better enjoy being the 'biggest' one in the family while I can!" Kyle has a big sister, Kaitlyn Elise, who is almost two years old.

Record Turnout for Annual Banquet

The annual awards banquet was a lively evening full of humor and gag awards, as well as serious awards. Department head Jay Bass was master of ceremonies for the evening, which primarily honored John Bredehoeft with the outstanding alumnus award (see related story).

The banquet was held April 24 at the Champaign Country Club, and more than 70 people attended. This was the biggest turnout for the banquet in recent years, in part because alumni awards were combined with the student awards ceremony.

"It's not an accident that we combined the student and alumni awards this evening," said Bass at the banquet. "Our alumni represent the best of what our students can accomplish, and they remind us of what the department is really trying to do. Tonight we celebrate what the department has provided to its students and what our students can aspire to."

The Estwing Award, sponsored by the Estwing Company, was given to outstanding undergraduate student Jeffrey Catalano. He received an Estwing Pick.

Maitri Venkataramani received the Outstanding Senior Award and a Brunton compass. Bass joked that Maitri also was voted the most likely to be department head—not to be confused with most likely to succeed!

Two outstanding teaching assistant awards were presented, one for each semester. Judy Becker received the award for the fall semester, and Joel Johnson received the award for the spring semester.

Limei Zhou was awarded the Outstanding Woman Graduate Student Award, which came with a cash gift made possible by a generous but anonymous donor who

wants to encourage women students to encourage women students in geology.

The Morris M. and Ada B. Leighton Award, established by Brud Leighton (B.S. '47, M.S. '48, Ph.D. '51), to honor his parents and to support student research, went



Clockwise from lower left: Lisa Noe, James Palko, Mike Brudzinski, John Baroffio (Ph.D.'64, GeoThrust committee member), Anna Sutton and Frannie Skomurski enjoy a laugh at the annual awards banquet.

to three students: undergraduate Dylan Canavan, and graduate students Michael Harrison and Judd Tudor.

For the first time, the department awarded a Midwest Alumni Research Scholarship Award, a new endowment established by the department's many loyal alumni in the Midwest. Kelcey Dalton, Megan Elwood, Lisa Whitenack and Aubrey Zerkle—all undergraduates—received support from this endowment.

Nine students received field camp scholarships. This award was established by alumni in the Rocky Mountain states to help undergraduates attend field camp. Students who received the award were Rebecca Ashton, Jeffrey Catalano, Aaron DeNosauquo, Alex Glass, Matthew Goddard, Peter Malecki, Jonathan Russell, Adam Scheiderer and Lisa Whitenack.

In addition to these awards, two faculty members also were recognized for receiving campus-

wide teaching awards. Steve Altaner received the William F. Prokasy Award for Distinguished Teaching from the College of Liberal Arts and Sciences, and Bass received the Campus Award for Excellence in Guiding Undergraduate Research. Bass graciously thanked the undergraduate students who worked with him in the lab, saying those students deserved most of the credit.

John Bredehoeft received the outstanding alumnus award, the highest honor the department can bestow on its alumni. The award recognizes a career of distinguished achievement in the field.

After the relatively serious part of the evening was finished, the students took over the microphone for a series of gag awards. Led by graduate student Judd Tudor and junior Dave Beedy, this segment of the awards evening elicited more laughter and embarrassment for various award recipients. In one of the segments, Tudor and Beedy showed candid photos of several faculty, including one that proved that Tom Johnson was really Ming the Merciless. Johnson responded with two awards of his own. Since this year's class was the first hydrogeology class he had ever taught, he presented them with the "Worst Class I've Ever Had" award, followed by the "Best Class I've Ever Had" award.

New Endowment Supports Field Camp

Ed Franklin, B.S. '56, recently established an endowment fund to help undergraduates afford field camp. He was motivated because of his own field camp experiences more than 40 years ago.

"Our field camp was the first time the University was at Sheridan, Wyoming," remembers Franklin. "It was a perfect time and we were taught really valuable information. Field



Carlton Chapman leading a field trip in 1941.

camp is something every working geologist should get a chance to do. At the end of my career I realized that field camp was key to my entire career, beginning with my first job in South America that was with a field party. That first summer I used almost everything I learned in field camp."

Franklin's career was spent entirely overseas, working primarily for what is now Exxon. He worked in Libya (for the company known then as Creole), Venezuela, Australia, Argentina, Thailand, Niger, Chad, Central African Republic, Egypt, Turkey, Spain, Portugal, Mozambique, China and Turkey. Franklin retired from Exxon in 1986 and immediately went to South Africa to drill some wells. After that he and his wife, who shared his peripatetic life, traveled around South Africa in a car. The

couple, who just returned to the states one year ago, has retired to Attica, Ind., where they are building a log home on 186 acres they inherited from Franklin's mother.

Franklin's gift is an example of the power of matching gifts. Exxon's policy is to match charitable donations by employees by a factor of three, up to \$5,000. So if a donor gives \$5,000, for example, Exxon gives that same organization \$15,000. Franklin is spreading his gift out over 10 years to maximize the contribution from Exxon. He hopes this will be enough of an endowment to make sure that every geology student is able to afford field camp.

"I still remember, when I was in school, a couple of kids could have really benefited from field camp, but they couldn't go. It was a real shame," said Franklin, who could attend because he was on the GI bill.

Franklin had established some scholarships for field camp several decades ago, but that effort petered out for various reasons. Once he retired he felt he wanted to do something, so last spring he met with Jay Bass and Morris (Brud) Leighton (B.S. '47, M.S. '48, Ph.D. '51), whom he knew from his years in Australia, to discuss the possibilities. It was Leighton who pointed out that Exxon matched gifts at a rate of three times the donor's level.

"I just wasn't aware of it," says Franklin.

That information spurred him on even more, because it meant that many more people could go to field camp with no strings attached.

Matching Gifts: Put Your Money To Work

Just like Ed Franklin, there may be other donors who are unaware that their employers match their own donations to certain charitable organizations. Not only are matching gifts a great way to magnify the power of your gift, it is a simple procedure. Just contact your human resources or personnel office to find out if they match employee gifts. If the answer is yes, your company will have a form, available from the personnel office, that you send in to the University with your check. We do the rest from there. So ask today if your company has such a program and watch your money go to work!

Undergraduates Gain Great Experiences Conducting Original Research

If you agree with the maxim, "those who learn best learn by doing," the undergraduates in the Geology Department have been doing lots of learning. At least 10 percent of undergraduates are doing original research in the department with many different faculty members.

Aubrey Zerkle, for example, is working with Bruce Fouke on new and innovative techniques in cathodoluminescence microscopy to examine near surface dolomitization processes. She is using these techniques in conjunction with detailed plane-light petrography and geochemical analyses to determine the timing of dolomitization and the composition of dolomitizing fluids within a sequence of partially dolomitized limestones from the Seroe Domi Formation in the Netherlands Antilles.

Zerkle aims to complete her B.S. thesis on this subject by the end of the fall semester and will then synthesize it with a similar thesis by her research partner, Kelcey Dalton. Zerkle spent last summer as Fouke's research assistant and preparing for her trip to Bonaire, Netherlands Antilles, in August. In Bonaire, she and Dalton completed the field work for their thesis projects. They hope to present their research at the 1998 Wisconsin Undergraduate Geology Field Conference at the University of Wisconsin this fall. Zerkle and Dalton were recipients of the Midwest Alumni Research Scholarships last spring.

"The undergraduate conference will be good experience for us," says Zerkle, "since we plan to present at the national level in 1999. My experience at the University of Illinois has been excellent. "Being able to do original research has definitely had an influence on my future plans. I have many high



Jay Bass, Megan Elwood and Jennie Jackson examine work at the Brillouin Laser Light Scattering apparatus which measures sound wave velocities in minerals.

school friends who attend schools around the country in the sciences, and none have been offered a chance like this to do real science."

Starfish and Dinosaurs

Lisa Whitenack, also one of the four recipients of the Midwest Alumni Research Scholarships, is participating in two areas of paleontological research. She is studying fossil starfish from the Paleozoic with Daniel Blake, and she is participating in the study of a new species of dinosaur discovered in the Morrison Formation of Wyoming. The tentative name of

this small diplodocid ("you can call him a dwarf brontosaurus, if you like," says Whitenack) is "Microseismus" (his field name is Malcolm). Whitenack spent part of the summer in Wyoming at the excavation, which involved removing at least four more pieces at the quarry where the dinosaur was originally discovered. This project is directed by Robert T. Bakker, curator of the Tate Museum at Casper College in Casper, Wyo.

"After my experience this summer with Malcolm, I definitely plan on getting my master's in geology and maybe even a doctorate," says Whitenack. "I feel that those of us in the Geology Department are extremely fortunate. Many of my friends are in other departments where they are not encouraged to become friendly with the faculty and staff and therefore don't have the opportunities to become involved in research."

Alex Glass, who graduated this summer, spent his undergraduate career researching stelleroids (starfish and brittle stars) with Daniel Blake (see related story). Glass traveled to Germany two summers ago to take part in the Nahecaris Project, a salvage operation run by the German government. Although other scholars have been recruited to the project, Glass was among the first to actually undertake the research, thanks to the Norman B. Sohl Award. He and Blake returned to Germany this past summer to continue the project. Glass presented results of this and other research at three different GSA conferences.

Gas Hydrates

Megan Elwood (also a recipient of a Midwest Alumni Research Scholarship) has conducted Brillouin spectroscopy work with Jay Bass for the past year and a half, studying the effects of water content in pyroxenes and measuring their elastic properties. This past summer she interned at Lawrence Livermore National Lab where she worked with gas hydrates, ice and hydrate deformation experiments. She also spent a month at the United States Geological Survey in Menlo Park, Calif., learning how to grow single crystals of gas hydrates. She hopes that this experience will enable her and Bass to do experiments with single crystals of methane hydrate.

"My summer work has given me a good idea of what to expect in a research field," says Elwood. "I'm really happy to have had the wide variety of experiences that I've had in the past two years. This summer, everyone I met was very surprised to hear I'm an undergrad," adds Elwood. "Especially that I'm just finishing my second year and already have one project done and am starting on a second."

Measuring Elasticity

Another of Bass' students, Jenny Jackson, is juggling several projects which will culminate in her senior thesis. Jackson, a senior majoring in math education and minoring in geology, has been trying to measure the elasticity of several materials by using an acoustic method. One project in-

volves measuring the density of aerogels, which are used for coatings on specific instruments that capture debris from comets in order to recover and study them. Using similar techniques, Jackson also is measuring ringwoodite, or spinel, a major component in the mantle's transition zone. Her research will provide information about the composition of the tran-

"Being able to do original research has definitely had an influence on my future plans. I have many high school friends who attend schools around the country in the sciences, and none have been offered a chance like this to do real science."

sition zone and whether the mineral velocities account for the seismic jumps seen in the transition zone. A third project Jackson is working on is measuring magnesium oxide at high temperatures. Magnesium oxide is a component in the hot lower mantle (deeper than 660 km), but nobody knows how much is there. Jackson's experiments will help answer that question. She is doing the experiments using a device that was invented by Bass' students.

Jackson hopes to present her findings at the AGU meeting in December and plans to attend graduate school to study mineralogy at Notre Dame, where she'll study with Peter Burnes (a visiting professor at the Geology Department who was profiled in the

Spring 1997 issue of *Geosciences*). She will focus on nuclear waste disposal problems at Yucca Mountain.

"As soon as I took a geology course I got really interested doing research," says Jackson. "I didn't have any idea in the beginning that I'd be doing so much. It's a real collaboration and I'm very much part of the lab."

Bass is quite pleased with the progress many undergraduates have made in their research projects. He recently received a supplementary National Science Foundation grant in the Research Experiences for Undergraduates Program that has helped him support undergraduate research in his laboratory. The University of Illinois recently recognized Bass' outstanding teaching and advising accomplishments by presenting him with the Campus Award for Excellence in Guiding Undergraduate Research. One reason Bass received this award, he says, is because of the outstanding research Jackson, Elwood and other undergraduates have conducted with him in his lab.

"I've been blessed with some extraordinarily talented students from geology, physics and materials sciences," says Bass. "Some of the outside students switched to geology for their graduate work. Our students are as good as you will find anywhere ... no, better!! All you have to do is provide them with the resources and they achieve things you would never expect."

Profiles

Undergraduate Award Makes Life-Changing Research Possible for Alex Glass

Undergraduate awards can often have a fundamental impact on a student's professional career. For example, because of a 1997 Department of Geology award, Alex Glass, who graduated this summer, traveled to Germany and conducted research that he presented at two GSA meetings and summarized in an undergraduate independent research paper. His experiences will continue to influence his geology career.

Glass was the 1997 recipient of the Sohl award, which was established in the memory of one of the department's most distinguished alumni, Norman F. Sohl, B.S. '49, M.S. '51, Ph.D. '54, who died in 1993. Sohl spent much of his career at the Smithsonian Institute and was a leading authority on Cretaceous gastropods and biostratigraphy.

"Alex has done very high quality work," said his adviser, Dan Blake. "He learned an enormous amount, not only about the pale-

ontology, but geochemistry. He learned a body of work that really prepared him for graduate school, as evidenced by the fact that he got in everywhere he applied—with support. I've had colleagues say to me, 'gee, it's hard to believe he's an undergraduate.' He's presented at three different conferences."

Hunsrueck Slate

Glass, a German native, has lived in the United States since 1989. When he was looking for a senior project, Blake suggested a project involving the Hunsrueck Slate found in the southern part of Ger-

many. Blake had had a longtime interest in the stelleroid fauna (starfish and brittle stars) found in the slate, which hadn't been described since the 1950s. The Hunsrueck, which is in the Rhenish Slate Massif of Germany, has an enormous number of exquisitely preserved sea lilies, star fish, brittle stars and other marine animals. Fossils have been emerging from the region for more than 150 years, primarily as a result of mining operations.

The last fossil-bearing quarry has just ended slate production. Because fossils are primarily found during roof-slate production, further fossil finds are unlikely. Because of the lack of stratigraphic control—no

one ever knows exactly where the slates being processed for roofing purposes come from—Project Nahecaris was established.

Project Nahecaris, founded by the German government, has two parts: a synthesis and survey of all the fossils in various collections, primarily in Germany, but also in



(Above) Castle Kaup in the Rhine River near Bacharach. The roof is slate mined from the area. The hills in the background are black slate and part of the Rhenish Slate Massif. (Right) Glass stands in front of an x-ray photo of a brittlestar. This picture was taken at a traveling German exhibit of the fossils found in the slate.



the United States and Great Britain; and an excavation of 55 tons of slate from the Bundenbach Quarry in order to establish stratigraphic control.

Glass met Nahecaris project coordinator Christoph Bartels in 1996 while visiting his parents near Berlin and they discussed the possibility of Glass joining the project. All discussions were theoretical, however, because Glass had no financial means to get back to conduct research. He thought that perhaps in five years, maybe more, he could get some grant money to work on the project. A few short months later he received the Sohl award. One of the first things he did was call Bartels and tell him the news.

"I think he was kind of shocked," laughs Glass. "We were among the first to come and actually do work. The Sohl award was like a gift from heaven," Glass adds. "I had no idea it was coming, and I wouldn't have been able to do this research without it."

Treasure Trove

Glass' trip to Germany revealed a treasure trove of fossil specimens. Glass and Blake were expecting to find a few hundred specimens, and they ended up seeing a couple of thousand.

"Every time we pulled out a fossil, we'd be oohing and aahing. They are absolutely remarkable. There is a diversity in this single

area that you wouldn't find even today in such a small area," says Glass.

Glass and Blake catalogued and studied fossil specimens from seven museums and two private collections. As a result of his summer experience, Glass has become interested in the sedimentological processes that created the Hunsrueck, the geochemical pro-

"The Sohl award was like a gift from heaven. I had no idea it was coming, and I wouldn't have been able to do this research without it."

cesses involved in preserving the specimens, and the ecology of the area that encouraged such a diversity and abundance of life in such a small area, not to mention the roof slate industry.

Fossils Pyritized

Many fossils found before about 1980 were never prepared past a basic identification. One difficulty is that although they had become pyritized, the fossils were still quite fragile. Often in the process of preparing them, the delicate spines, for example, were damaged.

Techniques have been vastly improved over the last 15 years, and the quality of specimens collected since then is unbelievable, says Glass. Delicate spines, surfaces of skin and ossicles are all visible.

Also as a result of his research, Glass has become very interested in the geochemical processes involved in pyritization. Glass will continue his study of echinoderms and geochemistry as a master's degree student with Bill Ausich, B.S. '74, at Ohio State University. He hopes to return to the Hunsrueck—and perhaps the University of Illinois—for his doctoral research.

Although Glass is, by any measure, an outstanding student, Blake is quick to point out that the opportunities for this level of undergraduate research are readily available.

"If you're so motivated, you can do high level work here," says Blake.

Glass notes that it was great being in a small department.

"The geology department really did replace my family," which had moved back to Germany, says Glass. "And I'm grateful to Professor Blake for his unflagging support throughout my undergraduate career."

Glass' advice to other undergraduates is "don't wait for a project to come to you. The people here are approachable and friendly, so it is easy to have some great experiences, like I did."

Michael Harrison Brings Focus, Passion to his Research

Graduate student Michael Harrison works fast: after being at the University less than a year he has already passed his qualifying exams and is well into his dissertation research.

"I have been very pleased with Michael's progress," says Steve Marshak, professor of geology and Harrison's adviser. "He came in with a strong structural background, he thinks and operates independently, and he's made very rapid progress since he's been here."

Last spring, the Department of Geology recognized Harrison's accomplishments by awarding him the Morris M. and Ada B. Leighton Award, named for Morris (Brud) Leighton's parents. The award also went to Dylan Canavan and Judd Tudor.

"The Leighton award meant a lot to me because Dr. Leighton is a great geologist whose name is synonymous with professional dedication and quality science," said Harrison. "I was truly surprised when I heard my name called at the awards banquet."

Harrison's research focuses on the Appalachian mountains, to which he has always been drawn.

"I've always had a fascination with the Appalachian mountains," says the Pennsylvania native. "It seems like some geologists are looking for more 'sexy' projects, like the Rockies or Himalayan mountains, and others may think all the questions in the Appalachians have been answered, but that's really not the case. There are still lots of mysteries in those old, venerable mountains."



(At left) Michael Harris and his wife, Diane, at the annual awards banquet. (Above) Quarry highwall exposing the Pennsylvanian-aged Pottsville Formation (top) and Mississippian-aged Mauch Chunk Formation (bottom) contact.

Lackawanna Synclinorium

Harrison, who got his bachelor's degree at Kutztown State University (Penn.) and his master's at Bowling Green University (Ohio), has been researching the Lackawanna Synclinorium, a large geologic structure in northeastern Pennsylvania. The formation was first described in detail in the 1940s, yet is still an enigma. The 110-km-long trough is part of the Appalachian fold-thrust belt. Although many theories have been suggested for the formation, they have been highly speculative, says Harrison. He intends to develop a

working model by virtually "un-folding" the folds and moving back the faulted blocks to try to reconstruct how the trough became what it is today.

The first step in his project is to map the synclinorium, which is the size of an entire geological quadrangle (approximately 60-square miles). Harrison managed to map about 60 percent of the area last summer and plans to finish that part of the project next summer. He is working in cooperation with the Pennsylvania State Geological Survey, which is providing coal-mining data and supplies. His work is supported by a USGS grant and the Leighton award.

Now he's in the lab, examining thin sections in order to conduct

strain analysis and to determine how much shortening occurred in the rocks and in what direction they were shortened. This microscopic examination will help Harrison identify the deformation mechanisms present at the grain-scale level.

Large Changes. Small Scale

"I always like to keep in mind that even very large structures, like the Lackawanna Synclinorium, begin with deformation at the grain scale," observes Harrison.

Although Harrison works quickly, he is far from frenetic. In fact the ponytailed, self-confessed *Seinfeld* addict, has a balanced and relaxed approach to life in general and geology in particular. Friends and colleagues describe him as focused and interested in what he is doing.

"I don't think of research as working hard because I like it so much," muses Harrison.

Even as a child, Harrison was so laid back that Boy Scouts seemed too regimented.

"I just like going out and doing stuff, I was never interested in earning badges," he says with a shrug.

In addition to watching television, and conducting research, Harrison has a passion for philosophy and writing, both of which he discovered in college. His love of philosophy led him to minor in that field. Harrison also shares a love of opera with his wife, Diane.

"Being a philosophy minor helped me become a better scientist," says Harrison. "I'm better at making research decisions. Besides if you can get through Emmanuel Kant, you can read any dry piece of literature!"

Harrison took a year off as a junior to experiment with creative writing as a career. To support himself he took odd jobs, such as telemarketing for the Franklin Mint. "It was very humbling for me and it forced me to come to terms with what I wanted to do," says Harrison of that time. "It took me a while to realize you can be a good writer and still have scientific vocation and that you can be a popular writer and do research."

Harrison wasn't always so passionate about geology, or anything else for that matter. With no direction, his high school performance was "dismal," Harrison remembers. Even his first semester at college was a struggle. Harrison credits a single geology course and professor for turning everything around for him.

"When I took my first geology course with Ed Simpson at Kutztown, it was like taking the blinders off. All of a sudden, I knew, I just knew what I wanted to do. I guess I always had the potential, but Ed found the switch," says Harrison.

Simpson sees it differently.

"I had nothing to do with Michael's success," he says with a laugh. "Michael is an incredibly sharp guy and always had lots of potential as a student. He took his junior year off and when he came back he was exponentially a different person. As soon as he figured out what he wanted to do, you wouldn't want to stand in his way."

It was Simpson who encouraged Harrison to present his undergraduate thesis at the southeast conference of the GSA.

"Boy! That was really nerve-racking!" remembers Harrison. "But that experience was a reaffirmation that this was what I wanted to do and that I could do it."

Still wracked by insecurity, Harrison applied to seven schools for a master's program, hoping to be accepted to one or two. Instead, all seven accepted him and he was caught in an unexpected quandary. After his undergraduate experience, Harrison realized that, for him, having a good mentor was more important than going somewhere with a national reputation.

"For me, it's not about the university so much as it is about the person I'm going to work with."

After meeting faculty at each place, Harrison settled on Charles Onasch at Bowling Green State University. It was Onasch who urged Harrison to continue on to the doctoral level. When it came time to choose a doctoral program, Harrison used the same selection method.

"Once I met Steve Marshak, I knew I wanted to work with him," said Harrison.

Harrison hopes to end up in the East and to stay in academics, after having had a taste of teaching as a teaching assistant both here and at Bowling Green.

"I enjoyed the little rewards of seeing students become interested in the topic," says Harrison. "Part of me loves teaching because I want to inspire others the way I was inspired by my various mentors."

"Michael would make an excellent faculty member," says Simpson. "He is a really sharp guy with lots of humility and self-reflection. He also has quite eclectic and diverse interests. He is familiar with the 'fringe literature' like the philosophy of science kind of stuff. And, I think, as a consequence, he thinks a lot more about the implications of what he's doing."

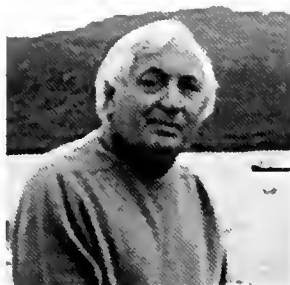
John D. Bredehoeft Adds "Outstanding Alumnus" To His List of Honors

When John Bredehoeft, M.S. '57, Ph.D. '62, started out, ground-water hydrology was about helping people find water, and that appealed to him.

"Hydrology was a pretty stable business, and was conducted near cities. People always need water, particularly in the desert, like Los Angeles, or Tucson," he said. "Besides," he jokes, "other industries, like petroleum and mineral industries, took place in God-awful places, like the north slope of Alaska, Saudi Arabia—and even southern Illinois," he adds with a grin.

But Bredehoeft's career, which began with a B.A. from Princeton in 1955 and included 32 years at the United States Geological Survey (USGS), has gone way beyond helping people find water. His personal research projects have become milestones of modern hydrology, and his work—published in more than 100 professional papers—has been widely recognized.

Last spring the Department of Geology awarded Bredehoeft the outstanding alumnus award in recognition of his lifetime achievements. He adds this to more than a dozen honors and awards he has received throughout his career. In 1997 alone, Bredehoeft received the Horton Medal from the American Geophysical Union, the Penrose Medal from the Geological Society of America and was voted a life member of the National Ground Water Association. Bredehoeft (along with last year's Geology Department outstanding alumnus, Paul Witherspoon) also is a member of the elite National Academy of Engineering (NAE),



John Bredehoeft receives his Outstanding Alumnus Award from Jay Bass at the annual awards banquet in April.

an organization with less than 2,000 elected members.

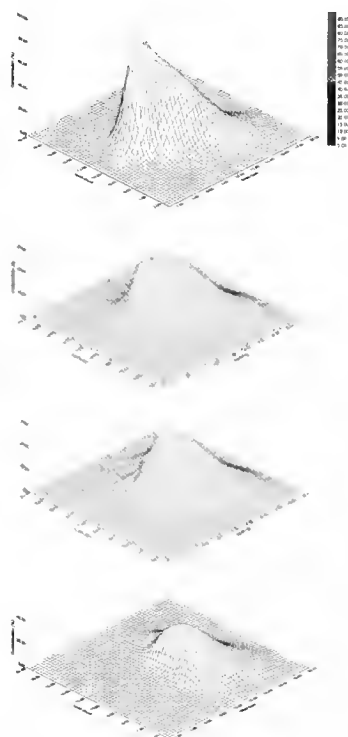
"John Bredehoeft's creativity and originality of thought, his insight and ability to identify the most critical and worthwhile problems of the day and his generous support and encouragement of young scientists combine to make him a role model for others to emulate," said Leonard F. Konikow, research hydrologist at the USGS, in his speech awarding Bredehoeft the Horton Medal.

Always Fluids in the Subsurface

"John has a very inquiring mind; he's very intellectual and very, very capable," says colleague and friend Keros Cartwright, Ph.D. '73, who is a principal scientist at the Illinois State Geological Survey (ISGS). "He has done an awful lot within the field of hydrogeology, including bringing hydrogeology into many other fields."

Others also have cited Bredehoeft's research for its vastly interdisciplinary nature.

"I have moved around from topic to topic in my research, always with the focus on fluids in the subsurface. It always seemed



Series of plots illustrating the changes over time of an area contaminated with diesel fuel. The top image illustrates the initial contamination; the next plot shows the changes after one year; the next image shows changes after two years; and the bottom image shows the contamination levels after 10 years. (Visit the web site at <http://www.MediaCity.com-hydrogup/> to see the plots in color and animated!)

there was more to learn: that was the fun in this endeavor," said Bredehoeft.

Bredehoeft has linked ground-water hydrology with geophysics, geochemistry, tectonics, petroleum engineering, economics and numerical methods. He also was one of the key people to bring computers into geology, says Cartwright. His pioneering computer work included the first widely used numerical codes for simulating ground-water flow and transport.

Among the most "earth shaking" of Bredehoeft's projects was his contribution to the classic Rangle, Colo., experiments where earthquakes were created and controlled by high-pressure fluid injection. Bredehoeft also has examined the hydrodynamics of fluid movements in the deep subsurface and developed methods to measure tectonic strain by using water wells.

Over the last several decades, Bredehoeft has been very vocal about the handling of nuclear waste and has provided thoughtful criticism and analysis of the Department of Energy's (DOE) handling of geologic disposal. He also has served on several National Academy of Sciences/National Research Council committees concerned with issues surrounding Yucca Mountain and the Waste Isolation Pilot Project (WIPP) and has served as consultant on the Yucca Mountain project. As part of this research he created a three-dimensional model of the Yucca Mountain area's response to an earthquake.

"Although John appears to be a quiet guy, he is a very powerful proponent of his view, which is usually correct!" says Cartwright, with a laugh.

In addition to his skills in technical areas, Bredehoeft's colleagues have cited his extraordinary talents in management and administration of research organizations. His career at the USGS was augmented with teaching positions at the University of Illinois; the University of California, Santa Cruz; and San Francisco State University. He was

"I was lucky to go to the U. of I., where my major professor and mentor was Burke Maxey. He instilled in those of us who were associated with him a demand for excellence."

a consulting professor at Stanford University for eight years.

Bredehoeft's career also has enabled him to travel around the world. One country he spent a lot of time in was Russia, where he now has many friends and colleagues. In 1991 he was elected to the Russian Academy of Natural Sciences.

"Retirement"

In 1995 Bredehoeft was ready for a change.

"I was getting into my early 60s and was ready to do something else; but I enjoy working and I didn't see myself retiring, so I decided to go into business," said Bredehoeft.

His business has, logically, been an extension of his career. The main difference is that Bredehoeft now has "clients." The Hydrodynamics Group, which he founded three years ago, is not a large company, though he subcontracts with

other geologists when the need arises, he says. After spending 32 years in public service, Bredehoeft is pleased to now be in business and describes his venture with characteristic modesty as "pretty close to being successful."

Among his current clients are the New Mexico Attorney General's office which has hired him to oversee the work of DOE regarding WIPP. In a case between Wyoming and Nebraska, Bredehoeft is a consultant on the depletion in stream flow in the Platte River caused by ground-water developments in the drainage basin. This case will go to the Supreme Court in 1999. Bredehoeft's group also is doing the hydrologic study of the Upper San Pedro River in Arizona and Sonora that is threatened by ground-water development.

Bredehoeft credits University of Illinois and Professor Burke Maxey with giving him a strong start on his outstanding career.

"I was lucky to go to the University of Illinois, where my major professor and mentor was Burke Maxey," says Bredehoeft. "He instilled in those of us who were associated with him a demand for excellence. At the time, Illinois was one of the few places to study ground water, and a whole generation of ground-water hydrologists came from Maxey. It's because of Maxey, in large part, that the University has such a strong tradition of training ground-water hydrologists."

Bredehoeft has created his own legacy, as well.

"Just as Maxey was one of the most influential people in hydrogeology in his day, John is one of the most influential of Maxey's students," notes Cartwright.

Alumni News

Obituaries

William E. McCommons, B.A. '47, died March 14. He was 75. McCommons founded McCommons Oil Co. in 1955 and was chair of the company at the time of his death. Born in Orrville, Ohio, McCommons served three years with the 6th Army Infantry in New Guinea and the Philippines and with the elite Alamo Scouts, the vanguard force in the occupation of Japan. He was awarded two Bronze Stars for valor, two Presidential Citations and the Purple Heart for wounds suffered from an enemy hand grenade during hand-to-hand combat.

McCommons had been active in the Boy Scouts since he joined in 1933. An Eagle Scout, he was a co-founder of Troop 800 and one of its leaders for 26 years. He and his wife Mary, who survives him, shared a passion for geology and archaeology. They traveled to Mexico, Central and South American and to the Middle East, Polynesia, Southeast Asia and China where they always took time to explore ancient cultures and civilizations. Several days before his death, McCommons

completed a historical novel on links between Mesopotamian and pre-Columbian South American cultures.

In addition to his wife, McCommons is survived by three sons, Bruce, Scott and Warren; his sister, Jean Garriott; his stepsister Doris Dale; his brother-in-law, Ralph Widener; and five grandchildren.

W. L. (Steve) Stevenson, B.S. '52, M.S. '55, died February 7. He was 66. He worked for many years for Shell Oil.

Dave McEachran, M.S. '85, died March 31. He had been battling Lou Gerhig's disease for several years. He did his thesis work on the Hudson Valley fold-thrust belt. After receiving his degree, McEachran worked for Rockware Inc., a computer software company in Denver that produces software for geological applications. He developed many programs, mostly for structural-geology applications, that are now used worldwide. He is survived by his wife and a three-year-old son.

Inc. was recently appointed as a board member of the State Licensing Board for Geologists under the new Professional Geologist Licensing Act. As a board member he will help implement the new law and review applications for licensing by geologists who expect to practice in Illinois. Palmer taught at Eastern Illinois University for several years and later moved to the Illinois State Geological Survey where he accepted early retirement in 1985. He has practiced geology for more than 40 years, primarily in Illinois and the Illinois Basin. Palmer lives in Charleston, Ill., with his wife, Mary.

Sixties

After 35½ years with the Illinois State Museum, **Richard Leary**, Ph.D. '80, retired as of January 1st. "I am now 'curator emeritus' and will continue my research at my own pace," he writes. "There is still work to be done on the early Pennsylvanian non-swamp floras of western Illinois. With a son (and grandson) in Kirkland, Wash., and a daughter (plus granddaughter and grandson) in Vilnius, Lithuania, I will be doing a lot of traveling! Next week, my wife and I leave for a week-long cruise of the Greek islands. From there we travel to Vilnius for three weeks visiting and touring the Baltics and St. Petersburg, Russia. We are looking forward to many years of active nomadic life!" Leary can be reached at leary@museum.state.il.us

James D. Carl, M.S. '60, Ph.D. '61, has finished 30 years of teaching in the SUNY system at Potsdam, NY. He was professor of geology in a department with five faculty and about 50 majors. His research has been on the geochemistry of Precambrian igneous and metamorphic rocks in the northwest Adirondack Mountains. "I have had lots of contact with Canadian geologists who work on the shield," he writes. "And I've recently published a set of Civil War Letters of a New York State soldier." He and his wife, Susan, have four grown children, one of whom is a graduate student in geology. A daughter, Anita Beth, married in November of '97 and everyone gathered in Potsdam for the first time in seven years. Carl and his wife have three grandchildren. He can be e-mailed at carljd@potsdam.edu

Daniel A. Textoris, Ph.D. '63, says of the newsletter, "keep the newsletters coming, and I wish MORE alumni would respond."

Albert D. Glover, M.S. '64, is a geologist emeritus with the Pennsylvana-

Alumni News is divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Fifties

William L. McKenzie, B.S. '50, is a retired petroleum consultant and licensed professional geologist with the State of Florida. His wife, Kathleen, passed away in 1996.

James Palmer, M.S. '56, president and owner of Sigma Consultants,

nia Geological Survey. He retired in 1996 as chief, western regional section, Geologic Mapping Division with more than 33 years of service. He works as a volunteer at the survey in completing the Jefferson County, Penn., coal report, and have 17 Survey publications. He writes, "The newsletter is great, why don't more alumni tell us about themselves?"

Louis W. Butler, II, Ph.D. '69, retired in 1996 after 37 years of federal, civilian and military service as an oceanographer and earth scientist. His principal activities were with the National Oceanic and Atmospheric Administration in many oceans, and finally, in Washington, D.C., behind a desk. He remarried in 1995 and has four children, six grandchildren and a seventh on the way. He is studying the history of art, master gardening, Scotland, Ireland and the Virginia/Maryland area. He works part-time as a master cruise counselor and still loves the sea. He is active in the local alumni chapter.

Seventies

William I. Ausich, B.S. '74, is professor and chair of the Department of Geological Sciences at The Ohio State University. He served as chair for the 1998 North-Central Section Geological Society of America Meeting held during March at The Ohio State University. He writes, "I was pleased to pass the leadership of this meeting on to Dennis Kolata, another U of I alumnus, for the 1999 meeting in Urbana!" Ausich can be e-mailed at ausich.1@osu.edu

Roy Spitzer, B.S. '71, M.S. '77, is associate and senior project engineering geologist with Rocky Mountain Consultants, Inc. He works primarily on geologic and geotechnical aspects of dams and reservoirs and tunnels in the Rocky Mountain west. He writes, "I enjoy the department news. It's fun to see the directions geoscience education

has taken—also fun to catch a glimpse of names I know in the alumni news."

Murry S. Gerber, M.S. '78, has been appointed president and chief executive officer of Equitable Resources, Inc. (ERI). He assumed his new position June 1. A 20-year Shell Oil Company veteran, Gerber will be leaving his position as chief executive officer of Coral Energy, a Shell affiliate he helped to create in 1995. While at Shell, Gerber also served as treasurer and led the strategic planning and financial activities for Shell's domestic exploration and production business. He also was responsible for managing various exploration programs in the U.S. and the offshore Gulf of Mexico.

Eighties

Gary Fleegeer, M.S. '80, has been a hydrogeologist at the Pennsylvania

Geological Survey since April Fool's Day, 1996. After various jobs in private industry and government in Colorado and Pennsylvania over the last 18 years, he says he's finally "found a home."

"I started the day after Al Glover, M.S. '64, retired so that the Survey could maintain their quota of two Illinois graduates (Bill Sevon, Ph.D. '61, is still here, also)," he jokes. Fleegeer recently finished an educational book on groundwater in Pennsylvania, and a geologic guide to Moraine and McConnell's Mill State Parks. He's currently working on a statistical analysis of the hydrogeological characteristics of all the stratigraphic units on the state geologic map, and converting the recently completed park guide to a web page on the Survey web page (www.dcnr.state.pa.us/topogeo/).

Fleegeer is also now the secretary-treasurer for the Field Conference of Pennsylvania Geologists. The previous secretary-treasure (State Geolo-

We received numerous responses to Hilt Johnson's obituary, including the following:

James D. Carl, M.S. '60, Ph.D. '61, writes "I appreciate reading of Hilton Johnson and thanks for honoring a good man."

Roy Spitzer, B.S. '71, M.S. '77, writes that he "was saddened to read of Dr. Hilton Johnson's death. Dr. Johnson helped me find the ways to get through graduate school. In the classroom he challenged me, as an advisor he provided excellent guidance—he even helped me get an interview for a part-time job in geology while I was going to school. Besides all the help that he provided—even though I never got to know him well—I always felt that he was someone to be trusted and a 'really good human being.' I had always meant to write him and thank him for his help. I'm sorry I procrastinated. I'm sure there are many other former students with

similar stories. The University and the geology community will miss him."

Gary Fleegeer, M.S. '80, writes, "I just got my alumni newsletter and was shocked to learn that Hilt Johnson had died. We had kept in touch periodically since I left in 1980, but hadn't since I last visited campus in 1994. I believe that the department should definitely replace Hilt. The department has a long history and outstanding reputation in glacial geology because of Hilt and George White. Because of that reputation, your prime location for the study of glacial sediments, and the presence of the ISGS on campus, the glacial geology program should continue. It's hard to imagine a major, Mid-western university geology program without glacial geology."

gist Don Hoskins) had held the job for 30 years. Fleeger built the Field Conference web page (www.paonline.com/gfleeger/fcpg/), and also one for the Harrisburg Area Geological Society (www.paonline.com/gfleeger/hags/).

Fleeger's daughter, Susannah, is now in first grade. "She's already smarter than the old man," he writes, "and seems to be teacher's pet at school. After 10 years, my wife Karen is starting to adjust to the East after living her first 34 years in the West. Hilt Johnson never could understand why I didn't like living in Colorado and wanted to move back east. Neither can Karen, but here we are!"

Fleeger adds, "I'd like to see more news from alumni in the newsletter. Now that I have been gone (as has much of my hair) for almost twenty years, and most of the faculty and staff has changed in that time, the news from alumni holds the most interest for me."

Fleeger can be reached at the Pennsylvania Geological Survey, PO Box 8453, Harrisburg, PA 17105-8453 (717) 787-2169 (work) (717) 957-0049 (home) or on line at: gfleeger@paonline.com.

"I'd welcome hearing from any of my old friends," he says.

Susan (Frey) Collins, B.S. '83, is a technical support geophysicist at GX Technology. She had twins, Jonathan Randolph and Elizabeth Ann, on Feb. 18. She can be reached at scollins@gxt.com or (713) 789-7250.

Lawrence Fieber, B.S. '83, is the director of Environmental Assessments at Mostardi-Platt Associates, Inc. He manages 20 geoscientists performing environmental due diligence investigations. He also is serving as president of the Illinois Indiana Section of the American Institute of Professional Geologists (AIPG) and is a board member of the Lake Michigan States Section of the Air and Waste Management Association (AWMA). He can be e-mailed at: llfieber@aol.com or lfieber@mostardi-platt.com



In Memoriam: K.O. Emery

Kenneth O. (K.O.) Emery, B.S. '35, M.S. '39, Ph.D. '41, died April 12 following a brief illness. He was 83. Emery was scientist emeritus at the Woods Hole Oceanographic Institution (WHOI). He received the

University of Illinois Geology Department's Outstanding Alumnus award in 1996.

Emery believed the most important duty of a scientist was synthesis, which required broad knowledge. Throughout his lifetime, Emery's eclectic interests included English and French gun flints from the chalk on the two sides of the English Channel, and coins discovered in foreign ports that reflected marine themes, as well as subjects more within the realm of marine geology.

Emery participated in a U.S. Geological Survey study of the Bikini Atoll before the atomic bomb tests were conducted there. After the war, he taught geology for 16 years at the University of Southern California and did research in the Gulf of California.

In the early 1960s, Emery moved to Woods Hole Oceanographic Institute (WHOI), where his first project was the study of the entire Atlantic continental margin between Labrador and Mexico. Undertaken in conjunction with the U.S. Geological Survey (USGS), this effort ended in 1967 with the establishment of a marine branch of the USGS.

Emery was the Henry Bryant Bigelow Oceanographer from 1975 to 1979, and served as first dean of the Woods Hole Oceanographic Institution/Massachusetts Institute of Technology Joint Graduate Program. He officially retired in 1979, though his enthusiasm for ideas and his friendliness to students and peers continued unabated until his death.

A former Guggenheim Fellow, Emery wrote almost 300 articles and 15 books and was a member of many professional organizations. He received numerous honors, including election to the National Academy of Sciences and the American Academy of Arts and Sciences in 1971, The Prince Albert Ier de Monaco Medal from France in 1971, and the University of Illinois Alumni Achievement Award in 1977.

He is survived by two daughters, Barbara K. Wish of Randolph, Mass., and Charlet E. Shave of North Falmouth, Mass.; a granddaughter, Rebecca A. Shave of Amherst Mass.; and two brothers, Almon C. Emery of Memphis, Tenn., and Harold B. Emery of Arvada, Colo., and Norman, Okla. His wife of 42 years, Caroline Alexander Emery, died in 1983.



Cyclotherm Club, May 1947 (photo submitted by James H. Fisher, B.S. '47)

Valla (Jones) Earl, B.S. '84, who wrote last time about her work with the Washington State Department of Transportation Construction, can be e-mailed at earlv@wsdot.wa.gov

Virginia (Ginny) Colten-Bradley, Ph.D. '85, began a new position at the Environmental Protection Agency last January. She is in the office of solid waste economics, methods and risk assessment division and is working on risk assessment and groundwater fate and transport modeling for municipal and industrial waste management units. Her husband, Michael Bradley (Ph.D. '82 in economics from the University of Illinois) is working on strategic planning for Freddie Mac. Their children, Anna (9) and Kara (6) are both happy and healthy. You can e-mail Ginny at colten-bradley.virginia@epamail.epa.gov

David B. Mitcheltree, B.S. '87, received his Ph.D. in geochemistry from the University of Tulsa last spring. He reports that he moved to Washington, D.C., in July. "If you're in town, get in touch!" he says. He can be reached at dbmtree@aol.com

Tom Zychinski, M.S. '89, works as a hydrogeologist for TetraTech EMI, a consulting firm in the metro Kansas City area. He and his wife, Shari, had a son, Henry Thomas on May

27, 1997. Tom says "Hi" to his old roommates Rob Lander, David Haymes and Dave Watso. He can be e-mailed at isabel2@aol.com

Nineties

Joseph P. Fagan Jr., B.S. '91, has been a geophysical engineer with Pearson, deRidder & Johnson Inc. of Lakewood, Colo., since 1993. His principal work involves merging potential field geophysics with other geophysical and geologic data to provide integrated interpretations for the petroleum and mining industries. He recently published an article in the *Oil & Gas Journal* titled "Aeromag interpretation technology helps chase Cambrian in New York." The article was co-written with David L. Copley.

Rod Padgett, B.S. '91, works for Bechtel performing construction engineering duties on environmental restoration projects at naval bases in the Jacksonville, Fl., area. He and his wife, Jennifer Eunson, had their first child, Noah William, last December.

Steve Hageman, M.S. '88, Ph.D. '92, writes that he had a great trip to Norway to visit Rob Lander, Ph.D. '91, and Linda Bonnell, Ph.D. '90. He was very impressed with their operation (they are also husband and wife) and thought alumni would like to know there is a feature article about their company in the March *AAPG Explorer*. Hageman works in the office of academic affairs at Chicago's Field Museum of Natural History. His e-mail address is shageman@fmpr.fmnh.org

Donald J. Colby, B.S. '97, works at the University of Illinois Foundation as network analyst, hardware and software installation maintenance, user training, purchasing and student employee supervisor. He writes that he finds the newsletter "Outstanding! Well done, informative, interesting and too short." His e-mail address is d-colby@uiuc.edu

Cathy Hier, B.S. '97, is working on her Ph.D. at the University of Minnesota. She is studying the lower crustal kinematics of the Caribbean/South American Plate Boundary. She recently received a three-year NSF Graduate Student Fellowship. Her e-mail address is chier@geolab.geo.umn.edu

Calling All Alums—Send Us Your Stories!

Have you noticed that the most frequent comment from alumni when they write to us is, "why don't more people write in and tell us what they're doing?!" So c'mon everyone, and drop us a line. Your classmates would love to read about what you are up to. We'd also like to inaugurate a section with your favorite memories and stories from your University of Illinois days. We'll include practical jokes, field trips gone awry, anecdotes about professors, or anything else that you remember about your student days.

REMEMBER: You can send your update for the Alumni News via e-mail: geology@uiuc.edu

Let's Keep In Touch

Please take a few minutes to let us and your classmates know what you've been doing: promotions, publications, election to office, marriage, parenthood, moving, awards. We'd all like to hear from you. Send your news to the Department of Geology, 245 Natural History Building, 1301 West Green Street, Urbana, Illinois, 61801; fax 217-244-4996; e-mail geology@uiuc.edu.

Name _____

Response date _____

Home address _____
(indicate if changed)

Office address _____

Home phone _____

Office phone _____

E-mail _____

Degrees from Illinois (with year) _____

Degrees from other universities _____

Present employer and brief job description _____

Other news you would like to share _____

Your comments on the alumni newsletter _____

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Here

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Department of Geology
University of Illinois at Urbana-Champaign
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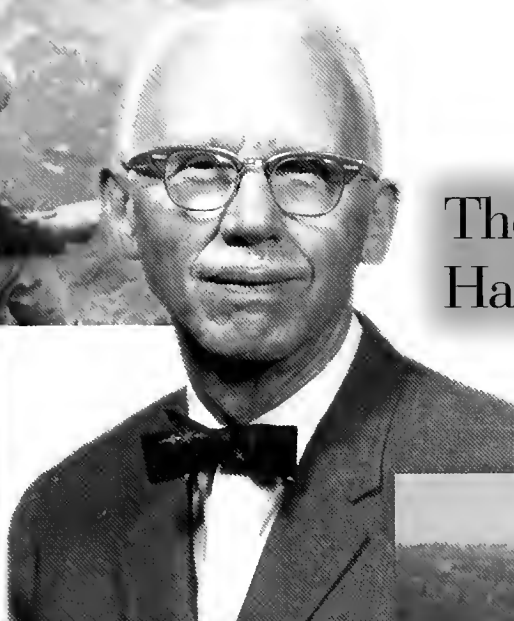
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**University of Illinois
at Urbana-Champaign**

Geosciences

**The Legacy of
Harold R. Wanless**



**Department of Geology
Alumni Newsletter
Spring 1999**

GeoSciences

Department of Geology Alumni Newsletter

Spring 1999

About Our Cover:

This issue of GeoSciences is dedicated to Harold R. Wanless, a member of the Department of Geology faculty from 1923 to 1967.

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GeoSciences is the alumni newsletter for the Department of Geology, University of Illinois at Urbana-Champaign. It is published in the fall and spring of each year.

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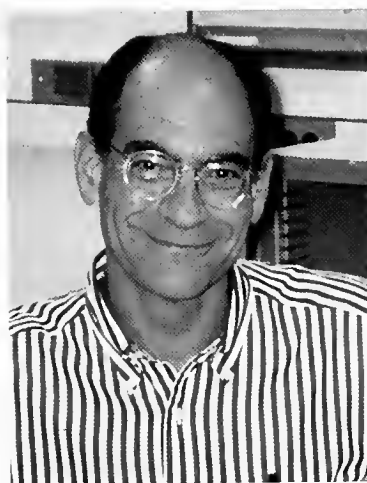
<http://www.geology.uiuc.edu/>

From the Department Head

Dear Geology Alumni,

Our Spring '99 issue of Geosciences is a bit unusual, in that it is dedicated to an individual: Professor Harold R. Wanless. This experimental format is due to a couple of things. First is the generous donation by Jim Baroffio (Ph.D. '64) of funds in the memory of his mentor, Professor Wanless. The time Jim spent with Wanless and the things he learned in both the personal and scientific realm have profoundly affected all aspects of Jim's life. Jim wants the memory of Wanless to live on in the form of annual graduate student scholarships, and resources for graduate level research. You can read about Jim's gift on page 8 of this issue, and how he will match the contributions of other alumni to the Wanless funds.

The second reason for this commemorative Wanless issue has to do with my personal interests in history and heritage. In any community, heritage is one of the things that binds people together and is a source of pride. This is as true for our Department of Geology as it is for any other type of community. I remember learning about Professor Wanless and cyclothems when I was taking my first geology course at Queens College in New York City. The plate tectonics revolution has changed the way we teach elementary Earth Science, and many achievements of past generations have moved out of the limelight. It is important for the current and future generations of Illinois geology students to know their heri-



Jay D. Bass

Harold Wanless was a great scientist who pursued his work with passion and energy, who made fundamental discoveries, and who taught much about life to those around him.

tage, and to learn of great discoveries that were made by scientists who formerly walked the halls of the Natural History Building. This issue of Geosciences is meant as a reminder of a great scientist who pursued his work with passion and energy, who made fundamental discoveries, and who taught much about life to those around him.

Activities in the department this semester have largely revolved around the recruiting of new faculty. The Geology Department has been fairly successful in

getting permission from the College of Liberal Arts and Sciences to search for faculty to replace a number of recent retirements. I hope to have some new faculty faces, names, and research areas to introduce to you next fall.


At our Annual Geology Banquet in April, we will be honoring Dr. Wilford "Willy" Weeks, with this year's Distinguished Alumnus award. Our spring banquet grew by a quantum leap last year, and the attendance by students, staff, and alumni was outstanding. In addition to honoring Dr. Weeks,

events this year will include student awards, and a gentle roasting of the faculty by the students. We look forward to having an even greater turnout by our alumni, and we strongly encourage you to attend. It will be a fun evening.

I will be continuing my work to get out and meet alumni. We are planning receptions in some cities that we have not previously visited, or at least not in recent memory. I am looking forward to meeting a large number of alumni in the coming year.

Please feel free to contact me if you have any news or thoughts you wish to share with other alumni. I am especially eager to know your reaction to the activities described in our newsletters, and our experiment with a dedicated issue.

Sincerely,


Jay D. Bass

Check Us Out - <http://www.geology.uiuc.edu/>

Excellent Teachers List

Craig Bethke, Andre Ellis, Dave Finkelstein, Jim Kirkpatrick, Steve Marshak, Alberto Nieto, Mindy Tidrick, Judd Tudor, and John Werner were named on the Incomplete List of Teachers Rated as Excellent for their teaching during the Spring 1998 semester. That is quite a long list for a department of our size! The department is proud of all those listed. Great Job!

Kirkpatrick Trip

During a trip to Japan and China in October and early November, Jim Kirkpatrick presented a series of lectures on NMR applications to mineralogy, geochemistry, and Portland cement. In Japan he gave a series of four lectures to government, university and industrial researchers on clay mineralogy and calcium silicate minerals sponsored by the Kyushu National Industrial Research Institute. In China he gave a plenary address on experimental and theoretical

investigation of molecular scale processes in hydrous minerals to the 4th International Beijing Symposium on Cement and Concrete. At Peking University and the China University of Geosciences he presented lectures on clay mineralogy and mineral surface geochemistry.

The Stork Brings More "Geology" Babies

Professor Craig Bethke and his wife, Abigail, welcomed a baby daughter into their family Nov. 3 at 5:35 p.m. Claire Genevieve Bethke weighed 7 lb. 7 oz. Mother and baby are both doing fine!

Assistant professor Tom Johnson and his family have a new little girl. Molly was born Feb. 18 at approximately 5 p.m. She weighed an amazing 9 lbs! Everyone is fine!

Graduate student Jungho Park and his wife, Mihye Won, had a baby girl Aug. 24. Hyerin Sharon Park weighed 7 lb. 4 oz at birth.

Join Us For The Annual Banquet

All alumni are invited to the geology department banquet, which will be held at 7 p.m. April 30 at the Champaign Country Club. At the banquet, alumnus Willy Weeks (B.S.'51, M.S.'53) will receive this year's Distinguished Alumnus Award. Willy was a field assistant of Don Henderson's and went on to get his Ph.D. from Chicago. He then became a glaciologist and worked on the physics of ice. The banquet will cost \$20 per person. To make a reservation, contact Barb Elmore at (217) 333-3542 or by e-mail at b-elmore@hercules.geology.uiuc.edu

Graduate student Roberto Hernandez and his wife, Dora, are happy to announce the arrival of John Alejandro Hernandez Sept. 18 at 7:40 a.m. John weighed about 7.5 pounds at birth.



Department members posed for a photo outside the geology building last fall. Department Head Jay Bass is eighth from the right in the back.



Above, from left: Gail Beach (David Beach's wife), David K. Beach (B.S. '73), Tricia Santogrossi (B.S. '74, M.S. '77), Stephen D. Chicoine (B.S. '72) and Jim Granath (B.S. '71, M.S. '73) ham it up. Right: Jay Gallagher, (B.S. '57) and Bill Soderman (M.S. '60, Ph.D. '62) at the Houston reception.



Alumni Gathered In Houston

Alumni gathered at the Petroleum Club in Houston Nov. 5 to meet old friends and hear about departmental activities. Some 30 alumni from Texas and Louisiana enjoyed plentiful food, drink and good company. The event was hosted by Bill Soderman (M.S. '60, Ph.D. '62). Department Head Jay Bass made a presentation on current activities and plans for the department, and Professor Stephen Marshak described his research in structural geology, highlighting the work of several of his students. Thanks to Bill Soderman for a great time!

George Klein Hosts Impromptu Reunion

George Klein, emeritus professor of geology and head of Geoscience Consultants, Inc., hosted an impromptu reunion with several alumni in Maracaibo, Venezuela, last August. Two alumni (Jerry P. Walker, M.S. '75 and J. Roger Palomino, M.S. '64, Ph.D. '76) and Klein were working as consulting geologists in the area and met for a dinner/reunion at the Bohio

Rodizzio Restaurant at the Hotel Del Lago. Klein's client was the Venezuelan subsidiary of Halliburton Energy Co., which is doing a secondary recovery project for Petroleos de Venezuela, Inc. (PDVSA). PDVSA has 12 concurrent recovery projects underway. Because of the impromptu nature of the reunion, the next one will be held whenever Illini Geo-alumni converge in Venezuela again!

Emeritus Professor Langenheim Elected to Champaign County Board

Ralph L. Langenheim, emeritus professor of geology, has been elected to the Champaign County Board with 74.7 percent of the vote in his district, which includes the campus area.

Harold Rollin Wanless

Baroffio Establishes Fund In Honor Of Wanless

For Jim Baroffio, Ph.D. '64, the opportunity to pursue graduate study with Harold Wanless was a crucial and unforgettable part of his training. His education at the University of Illinois led to a varied and productive career, culminating in his appointment as president of Chevron Canada Corp.

Now Baroffio wants to give the same opportunities to future students, while honoring his mentor. He's doing this by establishing the Harold G. Wanless Graduate Award Fund to support graduate students in geology. The principal will be held in perpetuity, and graduate scholarships will be awarded from the interest earned each year. This fund will also ensure that future students know who Wanless was, and what he accomplished. Quite appropriately, the Wanless awards will be used to attract the highest quality graduate students to Illinois, and will be granted on a competitive basis.

You can help to honor and preserve the memory of Wanless. Jim Baroffio will match contributions to the fund by other alumni up to a total of \$50,000. So if you remember Harold Wanless as a great teacher and inspiration, or if you would like to help give future students the opportunity to study at the University of Illinois, please send your check to the Harold G. Wanless Graduate Award Fund in Geology, University of Illinois Foundation, Harker Hall, 1305 West Green Street, Urbana, IL 61801.



Harold Rollin Wanless

Harold Rollin Wanless was born in Chicago, Ill., in 1898. Wanless' father (William Tanner Wanless) died in the 1906 San Francisco earthquake, after which Harold matured under the care of his mother, Rhoda, a nature study teacher in the Chicago schools. He received his bachelor's degree with high honors in 1920, his master's in 1921, and his doctorate in 1923, all from Princeton University. He spent the summers of 1920, 1921, and 1922 doing field work in the Big Badlands of South Dakota.

Upon receiving his doctorate, Wanless joined the Department of Geology of the University of Illinois. This became a lifetime affiliation. Appointed an instructor in 1923, Wanless advanced to associate in 1926, to assistant professor in 1929, associate professor in

1937, professor in 1946, and retired as professor emeritus in 1967. He served as acting head of the Department of Geology in 1946-47. From 1925 on he also was employed by the Illinois State Geological Survey as a geologic mapper. This initiated a close association between the survey and the department that continued throughout his career and even today. He also maintained a consulting practice from 1953 until his death.

Wanless' principal contribution to geology is the cyclothems theory, promulgated in association with J. Marvin Weller. This theory was later extended, explained and modified by Wanless during his life's work. At the beginning of his career Wanless began geologic mapping of Pennsylvanian rocks in west-central Illinois and Weller,

newly employed by the Illinois State Geological Survey, began collecting Pennsylvanian fossils throughout the state. Early in this work, they jointly recognized that these rocks and fossils occurred in similar cyclically repeated sequences which they identified and traced throughout Illinois. Together, in the early 1930s, they announced discovery of the cycles, named them, "cyclothem," and explained them as resulting from successive, widespread expansion and contraction of seas overlapping the continent. At first, the changes in sea level were ascribed to repeated continental uplift followed by subsidence, an explanation advocated by Weller throughout his career. Wanless, however, soon suggested, in *Sea Level and Climatic Changes Related to Late Paleozoic Cycles*, 1937, with Francis P. Shepard, then a colleague at the University of Illinois, that the cyclic, Late Paleozoic sea level fluctuations were caused by repeated melting and freezing of continental glaciers in the southern hemisphere. In 1960 Wanless' "Evidences of Late Paleozoic Glaciation in Australia" first

identified enough separate, southern hemisphere glacial episodes to account for Pennsylvanian cyclothems.

In support and amplification of the cyclothem theory, Wanless and his group at Illinois demonstrated the extremely widespread persistence of very thin layers of rock and the cyclothems in which they occur throughout the Pennsylvanian rocks of the eastern two-thirds of North America. Principal publications documenting this work appeared between 1944 and 1975. In addition, Wanless traveled extensively in Europe, Australia and South Africa, consulting with geologists and personally viewing Pennsylvanian-aged rocks. In consequence, he demonstrated world-wide late Paleozoic cyclic sedimentation and stimulated widespread investigation of the phenomenon.

Inasmuch as individual cyclothems record very short intervals of time, synoptic reconstruction of successive geographic patterns throughout the areas of their occurrence became feasible. Thus, Wanless, with his students' assistance, examined many thousands of well records, mine exposures and natural outcrops and made environmental maps for Midwestern North America during successive, short periods of Pennsylvanian time. These maps, posthumously published with C. R. Wright in *Paleoenvironmental Maps of Pennsylvanian rocks in Northern Midcontinent Region*, 1978, have been important in prospecting for

high quality coal adjacent to ancient major river channels, and for petroleum trapped in shoreline, river and deltaic sand bodies.

Wanless also was in the forefront of early development of aerial photographs as tools for attacking geologic problems. He was especially active in studying modern shoreline features as models for explaining sediment distribution in Pennsylvanian rocks. *Our Changing Shorelines*, 1971, with Francis P. Shepard, summarized this work.

Wanless' maps have been important in prospecting for high quality coal adjacent to ancient major river channels, and for petroleum trapped in shoreline, river and deltaic sand bodies.

Wanless was an organizer and guiding spirit in the TriState Geological Field Conferences, a series of annual meetings of Iowa, Wisconsin and Illinois geologists. These field reviews and critical discussions of investigations in progress at regional research institutions between 1933 and the mid-1960s profoundly influenced North American Paleozoic stratigraphic research. Wanless was a Fellow of the Geological Society of America and a member of the Society of Economic Paleontologists and Mineralogists, and American Association of Petroleum Geologists, repeatedly serving on soci-

etally organized research and educational programs. He was president of the Illinois State Academy of Sciences in 1928-1929. He was elected to Honorary Membership in The Society of Economic Paleontologists and Mineralogists in 1970.

My personal impression of Harold was that of a memorable and unique personality. First of all, he was highly intelligent—one of the best minds I have ever known. He worked almost constantly. He was friendly and sociable, but

worked prodigiously with his samples, logs, maps and reports. To his students and colleagues he appeared to have no hobbies or recreational activities. He was humble and soft-spoken and never spoke ill of anybody. Harold won the respect and affection of almost everybody with whom he came into contact. In fact, some wished that he would show a sharp edge from time to time.

Wanless married Grace Rogers of Philadelphia, Penn., Aug. 7, 1926. He continued to confer with co-authors, revise manuscripts and correct proofs until a few days before his death. His only child, Harold Rogers Wanless, became a professor of geology at the University of Miami.

This article was excerpted from Langenheim, R.L. Jr., "Harold Rollin Wanless," in John J. Garraty and Mark C. Carnes, eds, *American National Biography*, Oxford University Press, 1999.

“One of the Most Kindly Gentlemen You Ever Could Imagine”

There are lots of anecdotes about Harold Wanless, who had more than a hundred students over the years and influenced many more geologists throughout his career. The anecdotes invariably reflect his photographic memory, his tirelessness, his sense of humor, his abhorrence of alcohol and his meticulous manner—particularly in monetary matters.

Ralph Langenheim remembers how “without maps and without hesitation Wanless unerringly zipped up and down back roads, highways, city streets and farm lanes; lecturing, pointing out moraines, and driving as we sought out the often minuscule exposures to be found in road cuts, quarries, strip mines, gravel pits and stream banks. His concentration on geology while driving was disconcerting to some and his lectures were given in a droning monotone, but the information was astoundingly complete.”

Don Henderson remembers Wanless as “very amusing and one of the most kindly gentlemen you ever could imagine.” Henderson does remember Wanless becoming irate once, however, when it was implied that he had been drinking. “He was absolutely outraged,” says Henderson.



At table (l to r): Donald M. Henderson, Ralph E. Grim, Carleton A. Chapman and Harold R. Wanless in the faculty skit at the Spring, 1950, Cyclothem Banquet. In the decade or so following WW II, the Cyclothem Club, aka Geology Club, held an annual banquet that included student skits roasting the faculty. There also generally was a faculty skit doing likewise to the students. The custom died out in the late 1950s with the graduation of the older, more independent minded GI Bill Students. Photo contributed by Donald M. Henderson.

Many alumni remember Wanless' tirelessness, noting that during field trips students started at 6 or 7 a.m. and didn't stop until dark. As Albert V. Carozzi writes, “after dinner between 7 and 9 p.m., the group was called back to the hotel lobby to review, in meticulous detail, the observations and conclusions of the day and to evaluate the pertinent maps and papers for the next day. The beady-eyed and exhausted audience then retired.”

Regarding Wanless' perpetual hunt for inexpensive, quick places to eat, Langenheim remembers, “Wanless apparently rated eating establishments by economy and speed of service. Had McDonalds been available we probably have subsisted entirely on its viands. Grim and intense as it sounds, however, Wanless' gentle personality, dedication and obvious concern for students made the whole thing a memorable experience. Our students loved it and visiting scholars usually found ways to ‘go along.’”

Norb Cygan recounts that, as a graduate student, he was in the field with Wanless and on an expense account. Cygan turned in the full cost of the meals on the road. Wanless turned in the full cost of meals—the cost of eating at home. “I remember being very upset and going to the department secretary feeling that I had done something very wrong, but she just said ‘don't worry, Harold always does that!’”

Educator, Friend and Guide

by Albert V. Carozzi

One of the major factors that influenced my decision to come to the department as a visiting assistant professor in 1955-56 was the presence on the faculty of Harold Wanless, whose international reputation was based on his cyclothem theory related to sea level and climatic changes. As soon as we met, he took me under his wing — it turned out that he also knew about my previous papers on the statistical studies of microfacies. In 1956 we presented, together with two of his students (W.G. Ziebell and E.A. Ziemba), a paper at the XXth International Geological Congress in Mexico City, based on a new interpretation of the Pennsylvanian column at Superior in Arizona, and four sections of the Platteville Group, Ordovician, of Iowa, Illinois, and

Indiana.

Another expression of Wanless' devoted interest in increasing my knowledge of American geology was his request that I participate in his graduate field course, Geology of the Upper Mississippi Valley, which consisted of a series of extended weekend field trips. He also encouraged me to attend TriState Geological Conferences, GSA regional sections, and Friends of the Pleistocene meetings. Most of my experience in American geology was obtained through Wanless' guidance.

What I remember most are trips led by Wanless himself, when he was in full command of the fleet of University of Illinois cars used on such occasions. Wanless drove the first car, often on the wrong side of the highway, describing all pos-

sible geological features within sight together with whatever bird or tree of interest showed up. Most road hazards went entirely unnoticed. An early (6 a.m.) old-fashioned breakfast with eggs, sausages and grits was the rule, lunch was generally forgotten, and our overnight stop was in what became known as a "Wanless hotel," that is a Spartan accommodation, possibly with a dining room, in some little town (not a motel) away from all temptations. Alcohol in any shape or color, in public or in private, was strictly prohibited, but I managed a few smuggling operations, unable to visualize such an uncivilized behavior.

This teaching discipline unquestionably left a deep imprint on all the participants. When starting my own graduate students on their microfacies theses, I was able to find all the places we visited in these field trips by following exactly the footsteps of Wanless.

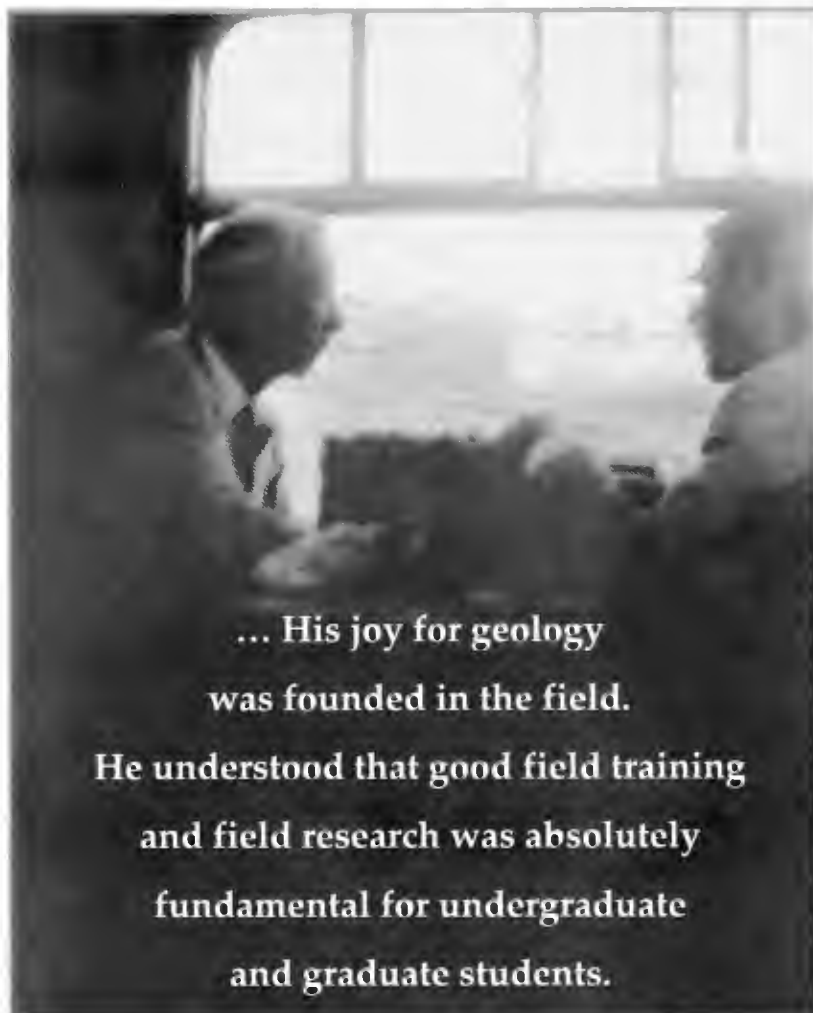
Throughout his more than 40-year affiliation with the Department of Geology, Harold Wanless taught and guided well over 100 students. Below is a list of them:

- | | | | | |
|---|--|---|--|---|
| Ames, John A. M.S. '50. | Eddings Arnold L. M.S. '47. | Johnson, Kenneth S. Ph.D. '67. | Orlopp, Donald E. M.S. '62, Ph.D. '64. | Sims, Dewey L. M.S. '57. |
| Anderson, Marvin J. M.S. '56. | El-Ashry, Mohammed M. M.S. '63, Ph.D. '66. | Kennedy, Virgil J. M.S. '48. | Osment, Frank C. M.S. '41. | Smith, Maurice H. M.S. '41. |
| Avcin, Matthew J. M.S. '69. | Eldridge, William F. M.S. '61. | Kenny, Leland F. M.S. '68. | Ostrom, Meredith E. M.S. '54. | Souter, James E. M.S. '66. |
| Baird, Donald W. M.S. '56. | Ellingwood, Robert W. M.S. '48. | Kidda, Michael L. M.S. '53. | Otton, Edmond G. M.S. '47. | Spotti, Adler E. M.S. '41. |
| Barnes, Mary E. M.S. '48. | Etheredge, Forest D.M.S. '53. | Koenig, Karl J. M.S. '46, Ph.D. '49. | Palmer, James E. M.S. '56. | Staffeld, Byron C. M.S. '54. |
| Baroffio, James, R. Ph.D. '64. | Gamble, James C. M.S. '67. | Lamb, Robert R. M.S. '48. | Palomino Cardenas, Jack R. M.S. '63. | Summerson, Charles H. Ph.D. '42. |
| Bauer, Charles B. M.S. '46. | Gawne, Constance E. B.S. '66. | Lane, Donald W. M.S. '58. | Parham, Walter E. M.S. '58. | Susong, Bruce I. M.S. '55. |
| Baxter, James W. Ph.D. '58. | Geisler, Jean M. M.S. '49. | Lennon, Russell, B. M.S. '57. | Parker, Margaret A. M.S. '53. | Trescott, Peter C. M.S. '64. |
| Berman, Byrd L. M.S. '53. | Glover, Albert D. M.S. '64. | Levish, Murray. M.S. '55. | Patterson, Jacqueline W. M.S. '51. | Tubb, John B. M.S. '61, Ph.D. '63. |
| Bleuer, Ned K. M.S. '67. | Gorman, Donald R. Ph.D. '62. | Lucas, Margaret J. M.S. '55, Ph.D. '57. | Patton, Howard L. M.S. '48. | Vail, Ruth S. B.S. '65. |
| Boardman, Richard S. B.S. '48, M.S. '52, Ph.D. '55. | Grinnell, Robert N. M.S. '52. | Lynch, Bernard W. M.S. '48. | Pearson, James G. A.B. '42. | Van Den Berg, Jacob, M.S. '56. |
| Brokaw, Arnold L. M.S. '42. | Grubb, Carl F. A.M. '32. | MacVeigh, Edwin L. M.S. '32. | Pendleton, Margaret M. M.S. '48. | Van Dyke, Lindell H. M.S. '48. |
| Bushman, Edwin F. BS '41. | Hardie, Charles H. M.S. '58. | Manos, Constantine, T. Ph.D. '63. | Phillips, Sanford I. M.S. '56. | Voris, Richard H. M.S. '52. |
| Century, Jack R. M.S. '52. | Harrison, John A. M.S. '48. | Mason, Arnold C. Ph.D. '55. | Plusquellec, Paul L. M.S. '66. | Wahl, F. Michael. M.S. '57. |
| Christy, Robert B. M.S. '58. | Hoover, W. Farrin Ph. D. '39. | McCabe, Louis C. M.S. '33. | Powers, Richard J. M.S. '57. | Watrous, Joseph A. M.S. '42. |
| Clay, John O. A.M. '48. | Hopkins, M. E. Ph.D. '57. | McCormick, Wade M.S. '53. | Pullen, Milton W. Ph.D. '50. | Weill, Daniel F. M.S. '58. |
| Cohee, George V. M.S. '32. | Horne, John C. M.S. '65, Ph.D. '68. | Metzger, William J. Ph.D. '61. | Rail, Elizabeth P. Ph.D. '56. | Weiner, John L. M.S. '61. |
| Collins, Lorence G. B.S. '53. | Hughes, Paul W. Ph.D. '63. | Miller, Marvin P. M.S. '46. | Reynolds, Robert R. M.S. '42. | Whaley, Margaret S. B.S. '69. |
| Conlin, Richard R. M.S. '54. | Hutcheson, Donald W. M.S. '57. | Miller, Don J. M.S. '42. | Rioux, Robert L. Ph.D. '58. | Whiting, Lester L. M.S. '58. Deceased. |
| Cropp, Frederick W. M.S. '56, Ph.D. '58. | Inden, Richard F. M.S. '68. | Morrill, David C. M.S. '58. | Robertson, Donelson A. M.S. '51. | Williams, Donald R. M.S. '62. |
| Dickie, George A. M.S. '55. | Irish, Ernst B. Ph.D. '49. | Mueller, Joseph C. M.S. '55. | Rogers, Robert E. M.S. '48. | Williams, Frederick E. M.S. '51. |
| Dickson, Beryl A. M.S. '65. | | Myers, Robert E. M.S. '55. | Roth, Robert S. M.S. '50. | Wright, Cynthia R. M.S. '63, Ph.D. '65. |
| Dillon, Edward L. M.S. '49. | | Newton, William H. M.S. '37. | Saxby, Donald B. M.S. '47. | Wright, Ramil C. M.S. '62. |
| Droste, John B. M.S. '53. | | O'Brein, Neal R. M.S. '61, Ph.D. '63. | Shelton, John W. M.S. '51, Ph.D. '53. | Ziebell, Warren G. M.S. '55. |
| Eccles, John K. Ph.D. '58. | | Odum, Ira E. M.S. '58. | Shideler, Gerald L. M.S. '65. | Ziemba, Eugene A. M.S. '55. |
| | | Oesterling, William A. M.S. '49. | Simon, Jack A. M.S. '46. | Zirkle, Robert G. M.S. '52. |
| | | | Simpson, Howard E. M.S. '42. | |

Hal Wanless Remembers His Father

Most of the alumni of geology remember my father as a teacher, advisor, field trip leader or professional colleague. As his son, I remember him as a great dad who, in spite of a busy work life, always had time for me. He was a father who guided me by subtle gestures and words but never by harshness. I was always welcome to join him in his personal and professional activities, which were primarily early morning bird walks and field trips with students or for research (perhaps that is why so many of you remember me as a brash little kid). He spent weeks in the summer canoeing and camping with me. His time with me instilled a joy of the outdoors, reverence for nature, curiosity for our Earth, a love to travel, and need for devoting quality time with one's children.

There are some things you may not know about my father: He was a conscientious objector in World War I, and as a result worked in a boat yard helping build non-war ships. His initial appointment at the University of Illinois (in about 1926) included the responsibility to teach interpretation of aerial photography to agronomy students. He was totally dependent on my mother to do home repairs, pay bills and do the cooking. He and my mother were active members of University Baptist Church, which provided another great sphere of friends. His private hobbies were birding, photography and stamp collecting. I only heard him say negative things about two people, and even those were more as a statement of disappointment. Every now and then he would sort



of go into a haze for several days, then disappear into his study for a day and come out with a manuscript that was basically complete and in final form. The concept of being in debt would keep him awake at night. The year we were in Australia (1958-59), the new chemistry had just come out but was not in my high school curriculum there, so every night he would re-teach me from Paulings book what had been covered in school.

Both he and my mother loved people, and I grew up thinking that a house full of faculty and students at dinner was normal.

The time that you and other people spent with them, both in person and through letters, kept them young in spirit into their final years.

Although my father would spend great amounts of time on data and studying well logs and such, his joy for geology was founded in the field. He also understood that good field training and field research was absolutely fundamental for undergraduate and graduate students. I applaud the Department of Geology for undertaking a fund raising program for student field activities. He would too.

Willy Weeks: A Colorful Guy

Glaciologist Willy Weeks, who will receive the Alumni Achievement Award (the department's highest honor) at the geology department annual banquet, marches to the beat of his very own drummer. For example, early in his career, when he had to choose between geochemistry and glaciology, Weeks (B.S. '51, M.S. '53) chose the relatively untraveled path.

"When I escaped from graduate school, geochemistry was rapidly becoming an 'in' topic studied by a number of very smart scientists," says Weeks. "Competing with these guys clearly was going to be a lot of work. Glaciology, on the other hand, was just starting to develop and some aspects of the subject were wide open. "It was like I'd discovered the Mother Lode: no competition, essentially no literature, and the Federal Government wanted to fund me. Besides, working at the ends of the Earth may have been cold, but it was never dull."

"Willy Weeks is a very colorful guy with a great sense of humor, but nothing gets in the way of him getting his work done," remembers Don Henderson, professor emeritus of geology and Weeks' advisor. "I could see from the beginning that Willy was as sharp as anyone I'd ever run into. He's easily one of the top half percent of students I ever had," adds Henderson, who taught at the University of Illinois for 40 years, instructing hundreds of students.

Sea Ice

Although Weeks has published on many different aspects of the world of snow and ice, he spent

much of his career investigating the structure and physical properties of sea ice. He was instrumental in describing the relationships between the internal structural properties and composition, and the resulting physical properties of sea ice, as well as the influence of the polar environment (water temperature, air temperature, etc.) on the properties of sea ice.

"Many of the processes that occur in rocks also occur in sea ice, although in ice they occur much more rapidly," Weeks explains.

Weeks notes, as an example, that pressure ridges, the features that form when ice floes collide and are the sea ice equivalent to mountain ranges, form in at most a day or two in contrast to millions of years for mountains.

"You can even get very close and observe exactly how the ice is deforming. You just have to be careful that you don't get incorporated in the ridge," he jokes.

Weeks notes that sea ice—formed when salt water freezes—is never more than 40 degrees Celsius colder than its melting point and therefore invariably contains a liquid phase (brine). The equivalent temperatures for many rocks would be in the 1200-1500 degrees Celsius range.

"You could consider sea ice to be an igneous rock that forms at a temperature that allows one to swim in its magma," says Weeks. "Also, the mineralogy of sea ice is very simple: ice, brine and a few solid hydrated simple salts. This allows you to focus on the geophysics of what is occurring instead of becoming entangled in mineralogical details."

In another research project,

Weeks figured out the relationship between the amount of salt trapped in ice, the growth rate of the ice floe, and the composition of the surrounding water. He also documented and developed an explanation for the striking crystal orientations that can occur in sea ice. Sometimes all the ice crystals will have their c-axes not only horizontal but all pointing in the



Willy Weeks

same direction. These ice sheets act like a single crystal with lateral dimensions stretching kilometers. Weeks found that the formation of these crystals is related to the direction of the current under the ice.

Within the topic of polar ice, Weeks ended up moving all around.

"The topics that were being funded kept changing," he says. "Just as soon as I had learned enough about a subject to vaguely understand what I was about, the funders would say, 'X is no longer a problem, but we are desperate to know more about Y.' So I would have to drag out 10 books and put together a field program to study Y. The good part was that I learned a lot of different tricks. However my main interest was always sea ice. These other subjects I did as stunts."

To date Weeks is the author of approximately 300 published papers. This body of work has

earned him numerous honors and awards, including election to the National Academy of Engineering—the equivalent of the National Academy of Science. He also received the Seligman Crystal, the highest honor presented by the International Glaciological Society; and the Emil Usibelli Prize for Excellence in Research from the University of Alaska in Fairbanks. He is also one of the few honorary members of the American Polar Society and a Fellow of the American Geophysical Union and the Arctic Institute of North America.

Champaign Born and Reared

Weeks was born and reared in Champaign and lived with his parents while in college. Although his parents were very supportive of his studies, Weeks had to put himself through college.

"We were not exactly rolling in money, so being able to live at home really helped both myself and my brother, who was another University of Illinois graduate." To help pay expenses, Weeks traveled around the region every weekend playing string bass in a dance band. "Music still is my favorite avocation," he says. "In fact, the music school thinks I'm one of their alums!"

Weeks studied bass with Phyllis Edwards and played in the University symphony. His experience included playing for both Igor Stravinsky and Aaron Copland.

"It was unheard of for Stravinsky to conduct an amateur orchestra, but he came because his son was a professor of music here. Stravinsky was a very precise conductor; not an arm waver. He definitely knew what he wanted and he knew how to get it from the orchestra," says Weeks. "I liked that."



"Hellaciously Good Time"

During and immediately following his master's degree program, Willy Weeks spent four field seasons in the southwest Colorado. His master's thesis was to map the igneous rocks of the Ute Mountains. Based on the only photo he had seen of the Utes, this didn't look too difficult. Unfortunately, the photo proved to be taken from a great distance. When he arrived in the region and went up to Mesa Verde to get a glimpse of the proposed thesis area, he looked to the west and saw a very imposing mountain range. "What's that? And where are the Utes?" he asked. The answer was, "Those are the Utes!"

"I realized instantly I was in over my head," remembers Weeks. "Fortunately, in six weeks I was able to pound on enough rocks and draw enough lines on the air photos (there was no topographic map of the region at that time) to escape from the University of Illinois with a master's thesis. Looking back on the area, I think it would have taken three full field seasons to map that area properly. Since then I have always tried to carefully scope out what I am undertaking before I arrive in the field."

However humbling that project was, it probably helped Weeks get what he describes as the "primo USGS field assistant's job in the Ouray-Telluride region of the San Juan Mountains." Weeks worked there for three more field seasons prospecting for uranium and also mapping the area. It was here that Weeks began mountain climbing. He and his colleagues climbed the 12- and 13-thousand-foot peaks during the week and on Sunday climbed the 14-thousand-foot peaks.

"I had a hellaciously good time and the opportunity to work with some very experienced geologists," Weeks says of that phase of his career. "I worked in Telluride when it was just a semi-deserted mining town. The town was so small that the first day I arrived and was buying groceries the clerk said to me 'will this be cash or charge Mr. Weeks?' 'Hey, how do you know my name?' I asked him. 'Well, we knew a geologist by the name of Weeks would be arriving today and you are someone we haven't seen around here before, so you must be Weeks.' said the clerk. Believe me, that would never happen in Telluride these days!" says Weeks, with a laugh.

Headed for the Mountains

Having grown up in Champaign, Weeks had never seen a hill, much less a mountain until he joined his advisor, Don Henderson, as a field assistant the summer before his senior year. Henderson and Weeks spent the summer mapping the geology of the rugged Crawford's Notch area of New Hampshire's White Mountains.

"When you live with someone for a summer you get to know them fairly well," says Henderson. That summer Henderson learned that Weeks had sworn off beer. "In the band business Willy saw lots of people on drugs and alcohol. He decided he wasn't going to touch that stuff until he got his life under his own control. He had a determination to succeed no matter what," says Henderson.

Today Weeks notes that he is the proud owner of a good-sized wine cellar.

"I only drink as a preventative to frostbite... However, one never knows when frostbite might strike," he adds with a grin.

Weeks continued at the University of Illinois for his master's degree in geochemistry. For his field work he headed west to the Ute Mountains (see sidebar). While writing his master's thesis, Weeks received a National Science Foundation fellowship that allowed him to go anywhere he wanted for doctoral work. On the strong recommendation of professors Art Hagner and Henderson, he chose the University of Chicago.

"I always appreciated the fact that when I got my master's degree, the University of Illinois said 'see you later,' and encouraged me to go elsewhere," says Weeks.

"And Chicago was very different from the University of Illinois. It was more of a hard science with graduate students coming from

math and physics. The University of Illinois focused more on field geology and preparing graduates to go into the petroleum industry. At Chicago I had to dig in and prove myself all over again."

Ice Cubes

It wasn't until after he got his Ph.D. that Weeks became interested in sea ice or, as he puts it, ice cubes. While still at Illinois he had received a ROTC commission as an Air Force officer. After defending his thesis in Chicago, the Air Force called him to active duty, assigned him to a research center in Boston and told him to study soil mechanics.

"I didn't know anything about soil mechanics and it didn't take me long to decide that I didn't like the subject," says Weeks in his typically upfront way.

Then he got a break. The Air Force was having problems with the radar sites along the Labrador coast. The terrain there was very mountainous, which meant they could not build conventional runways. Instead, they hoped to land wheeled aircraft on sea ice with as heavy load as possible. They needed someone to tell them what loads the ice would bear—"and if something went wrong, they needed someone to blame!" adds Weeks. He saw his chance and volunteered.

"Since I was the only person who wanted to go, I got the job," he says, jokingly.

After the Labrador project, the Air Force sent Weeks to Baffin Land and then Greenland. After completing his active-duty commitment, Weeks was hired to teach geochemistry at Washington University in St. Louis. During the summer, he started to do contracts for the Cold Regions Research and Engineering Laboratory (CRREL),

an organization located in Hanover, N.H. that also was interested in sea ice. Working in cold rooms, Weeks studied the structure and properties of sodium chloride ice, which is like sea ice but simpler.

It was at this point Weeks opted for the path less traveled and officially switched from geochemistry to glaciology.

"I had to admit to myself that I couldn't do justice to both subjects at the same time," he said.

Weeks moved to CRREL. He ultimately worked there for 26 years. Then Weeks moved to Alaska where he became a professor of geophysics at the University of Alaska Fairbanks as well as chief scientist at the Alaska Synthetic Aperture Radar Facility. By 1996 Weeks was ready to slow down a bit.

"I'd done polar field operations for 40 years and I'm still alive, so why not quit while I'm ahead," he says. He continues to consult and travel extensively and is working on a book *On Sea Ice*.

Weeks' work has taken him all over the world, most obviously to both polar regions. His peripatetic nature is abetted by his wife, Marilyn McDonald, a woman whom Weeks describes as "a total adventure travel freak who makes me look like a couch potato." Together they run rivers, sea kayak, camp and scuba dive. She thinks up things for them to do while he tries to keep them from getting killed, says Weeks. McDonald even "coerced" him into making a parachute jump, though he recently talked her out of bungee jumping since she has a metal bolt in her neck.

"Actually," notes the 70-year-young Weeks wryly, "bungee jumping is safer than parachuting. It just looks scarier because the ground is closer."

Andre Ellis Travels Far for "Pioneering Research"

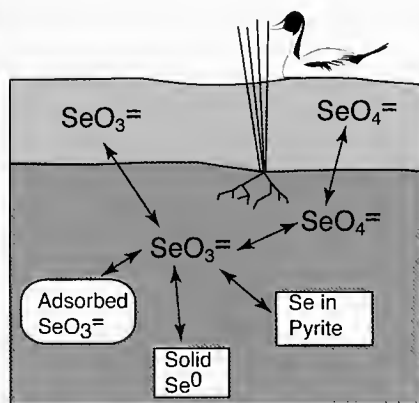
Andre Ellis is a long way from home. The Bombay, India, native was drawn to the University of Illinois Geology Department by the research of Tom Johnson, one of the newer members of the department. Johnson, an isotope hydrogeologist, studies contaminant transport.

"Tom's research was the best match with my own interests," said Ellis, who considered graduate programs in Australia and the U.K., as well as in the U.S. and his native India.

For his master's thesis, Ellis is addressing the problem of selenium contamination in groundwater. Selenium has many oxidation states. The more soluble ones are the more toxic. In large concentrations selenium in the water can be deadly, particularly to birds (see Johnson story in Geosciences Fall 1997). Researchers have recognized that in oxygen-poor conditions, selenium in the environment is converted from soluble forms (selenate and selenite) to insoluble—and non-toxic—forms (elemental selenium). One current theory is that naturally occurring microbes in solution reduce selenium to a non-toxic state. The process may also be abiotic.

Ellis is working to understand the process of microbial reduction of selenium using two techniques: one is to measure the concentration of selenium in solution (which should be reduced over time), and the other is to identify the way the selenium stable isotope ratios shift during the reduction process. Sulfur and nitrogen isotope ratios have been used to

study reduction of these elements for some time, and Johnson's group is developing a similar capability for Se. Through a phenomenon known as the "kinetic isotope effect," lighter isotopes are reduced slightly faster than heavier isotopes. With Se, this effect is observed as a decrease in the $^{80}\text{Se}/^{76}\text{Se}$ ratio.



The selenium cycle in nature (diagram courtesy of Tom Johnson).

Ellis can measure the changes in concentration of selenium over time with an atomic absorption spectrometer that he and Johnson rehabilitated with the help of Ed Lane, an electronic engineering technician in the department. Ellis can measure the isotope ratio shift using a mass spectrometer technique developed by Johnson and his colleagues at the U.S. Geological Survey in California.

"Each element has its own quirks," notes Johnson, but "of all the elements studied so far, selenium is one of the hardest elements to run mass spectrometer measurements on. One problem is that we have to heat the selenium

to run mass spectrometer tests, but selenium vaporizes at relatively low temperatures."

Ellis is hoping to document microbial action by understanding this shift in isotope ratios between ^{80}Se and ^{76}Se . As reduction takes place, the microbes reduce more of the selenate that has the lighter isotopes, says Ellis. As the reduction progresses, the selenate that is left behind contains more and more of the heavier isotope in relation to the lighter isotope.

"We concentrate on and measure the ratios between these isotopes because it is the most representative of all the isotopes and gives us the best results," says Ellis. "The shift in isotope ratios is caused by the reduction of selenium, so if you see the shift, you know reduction is happening," says Ellis.

In The Lab

With guidance from Johnson, Ellis is trying to reproduce in the laboratory what may be happening in nature. He uses Illinois soil (and only the natural microbe population already in that soil) and adds oxidized (soluble) forms of selenium, just as it occurs in nature. For his experimental control, Ellis used autoclaved soil. He then sampled the selenium concentration regularly. The first experiment took two weeks before all the selenium was reduced. It's a two-step reduction: selenate goes to selenite and then selenite reduces to elemental (solid) selenium.

Ellis got some good results: There was a decrease in the concentration of selenium. However, the shift in the isotope ratio wasn't as much as Ellis expected, particularly for the first phase in which selenate goes to selenite. There was a shift, however for the second step of the reaction, when selenite goes to elemental selenium (the solid form).

Ellis and Johnson are thinking that perhaps the reaction went too fast, which can affect the isotope shift. So for the last several months Ellis has been working to adjust the reaction. The reaction can be slowed down by changing the temperature at which the process takes place, or the concentration of selenium or the electron donor (the carbon in the soil). These are all things Ellis is pursuing now.

In spite of these struggles, Ellis is still happy he chose this particular project.

"There are many advantages to being part of something so new and pioneering," says Ellis. "We are the first

ones working with the selenium isotope ratios, and Tom himself developed the techniques to measure it, so it's been a great project."

For his part, Johnson appreciates what he describes as Ellis' "quiet ambition."

"The first day he came here he immediately started talking about his research project options," says Johnson. "Andre is pretty driven. This has been a very interdisciplinary project, and Andre has been quick to pick up whatever he needed to pick up."

That has included learning some microbiology. The first semester he arrived, Ellis took a microbiology course conducted by Craig Bethke (Ph.D.'85), professor of geology at the University. The

course was an overview of the field that included a look at different types of microbes and the conditions that would be needed for them to flourish. Rob Sanford, a microbiologist in Civil Engineering also helped teach the course.



Above: Ellis (second from left) with the isotope hydrology group. Also pictured are (from left) graduate student Yoshie Hagiwara, post-doctoral student Mitch Herbel, Tom Johnson, and post-doctoral student Dipak Sahoo. Photo behind shows Ellis (at right) on a visit home to Bombay with some college friends, Sandeep Saxena and Anil Naidu.

Seeking Pioneering Research

Ellis was first introduced to geology in a high school geography course.

"I can't remember exactly what first appealed to me about geology," says Ellis. "But part of it was how much it relates to the natural world."

Ellis' high school experience was enough to get him interested in geology in college. The geology department at the University of Bombay offered a concentration on either petrology or hydrology. Ellis chose hydrology because north of Bombay there are major water problems.

"There isn't much water in the first place and there are a lot of

industries there, too. So one problem is the availability and the other problem is the contamination. And it's no fun to have both together," says Ellis.

After college Ellis was ready to continue his studies, but it is difficult in India to do

what he calls "pioneering research."

"The moment you want to go on, it's not so easy," he says. Facilities are improving, but it is still hard to find someone to work with there, he says. So he started looking elsewhere for graduate programs.

"The University of Illinois has a good reputation overall and the environmental programs are good both in geology and in civil engineering," says Ellis. "Also, there is a large inter-

national community, which I was aware of. Because of all these things, I had applied even before I knew about Tom Johnson, since he had only just arrived. Still, this ended up being the best opportunity. I was looking to do something very, very different."

Ellis plans to complete his master's degree in August, two years after arriving, and to continue at the University of Illinois for his doctorate. Beyond that, his future is unclear.

"Ultimately, it would be nice to go back home and make use of what I've learned here," muses Ellis. "But it's hard to know what the future will bring."

Alumni News

Obituaries

W. Arthur White, B.S. '40, M.S. '47, died August 13 in Urbana. White was a clay mineralogist and a long-time staff member of the Illinois State Geological Survey.

I. Enver Altinli, who was a visiting scholar at the University of Illinois Department of Geology in 1962 died in Istanbul, Turkey. Altinli worked with Albert Carozzi on Silurian reefs and associated carbonates.

Alumni News is divided by decade. Those who were affiliated with the Department during part of one decade through to the next are listed according to the last degree received. Within each decade, items are listed in yearly sequence, not alphabetically.

Forties

Ed Bushman, B.S. '41, writes that his daughter Mary Claire Bassett is expecting her seventh child, his eighth grandchild. His wife, Louise, is in failing health. "Friends in the community help in various ways," he writes. "One couple helped with laundry for more than a year and our church people visit. Louise can no longer stand nor walk, so is unable to move from wheelchair to our auto and we are limited to a large professional van at the local hospital... But life is good."

Fifties

Howard Cramer, B.S. '49, M.S. '50, retired from the Emory University Department of Geology in 1987 where he had also been chair for 10 years. "I had a blast!," he writes. These days he teaches adult-oriented classes in geology from time to time as part of Emory's outreach program called the Senior University. "There are lots of older folks and we have about 30 or 40 per class once or twice a year. It seems funny having students older than I am, but easier in some ways because they understand the anecdotes I tell, whereas the youngsters did not. Like stories about coal - the kids

know nothing of it! I used to take tour groups to South America, East Africa and the eastern Mediterranean. That was another great way to spread the gospel of geology."

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Paul E. Schnurr, B.S. '51, retired recently and says, "I spent my entire petroleum exploration career in the western United States: Alaska and offshore of the west coast of the USA. Unfortunately the environmentalists and politicians have nearly shut down the offshore exploration and severely curtailed onshore exploration, so retirement looked good."

Clyde Fisher, B.S. '53, is living in Lynden, Wash., where he owns and manages Quiet Springs Orchard. He notes that he and his two brothers

all graduated from the University of Illinois Department of Geology: James '42, himself in '53, and Robert '54.

Richard M. Winar, B.S. '53, M.S. '55, is the environmental concern coordinator for the Oakland County (MI) Road Commission. In this position he's the internal consultant on environmental and geological problems faced by new highway construction. "Best regards to my former classmates," he writes. "Hope the last 45 years went well for you all. I urge old friends to drop a line via e-mail. It's nice to hear about the news from people I had almost forgotten about—but never did."

E-mail: MNMG47A@prodigy.com

Norb Cygan, B.A. '54, is now adjunct professor at the University of

In Memoriam: Harold W. Scott

Harold W. Scott, professor emeritus of geology, died October 30 in Urbana. He was 92. Scott received his bachelor's and master's degrees from the University of Illinois and taught in the geology department from 1937-1967. From 1967-1974 Scott was chair of the Department of Geology at Michigan State University.

Scott's research interests focused on stratigraphy and a number of microfossils, primarily ostracoda and conodonts, and sponge spicules and foraminifera. He is also noted for the discovery of conodont assemblages.

In addition to teaching, Scott worked for H.L. and Bunker Hunt exploring for oil and negotiating leases in Libya, Egypt, Turkey, Greece, Italy, Pakistan and the Mediterranean Islands. He also published numerous articles and several books. Proceeds from his book *Sugar Creek Saga: Chronicles of a Petroleum Geologist* go into the Harold W. Scott Fellowship Fund to support outstanding graduate students. Scott also was co-author of two volumes of biographical essays, *Memorable Americans* and *More Memorable Americans*.

In 1949 Scott was a distinguished lecturer for the American Association of Petroleum Geologists, and in 1995 he received the Department of Geology Alumni Achievement Award. He was a member of the Association of Petroleum Geologists, Geological Society of America, Phi Kappa Phi and Sigma Xi.

Although he retired in 1974, Scott continued to lecture and write for many years. His interests were in the relationship of oil to the welfare of people and the impact on society of population growth.

Memorial contributions may be made to the Harold W. Scott Fellowship Fund in Geology, University of Illinois Foundation, Harker Hall, 1305 W. Green St., Urbana, Ill. 61801.

Northern Colorado. He has received the American Association of Petroleum Geologists Public Service Award and the Rocky Mountain Association of Geologists Public Service Award for work in early science education on various boards and committees, including Dinosaur Ridge Science Education Center near Denver, Co. Cygan's first wife, Carol Dunnivant Cygan (Ed.'56), died January 1992. Cygan established the Elementary Education Science Teaching Scholarship in her name at the University of Illinois College of Education. He remarried Royann Gardner in 1995. This winter, Cygan introduced several grand-nieces and -nephews visiting from Florida to the joys of snow sledding and skiing (not to mention snowball throwing!).

Bruce Bohor, Ph.D. '59, retired from the USGS but is still going into the office every day. He also has been awarded a position of Research Associate at the Department of Geological Sciences at the University of Colorado, Boulder.

Carl G. Davis, B.S. '59, retired from DACC (Danville Area Community College) this year after teaching part-time for a year. His daughter, Liz, is a senior at the University of Illinois as an English major. Two of Davis' articles have been printed by the Danville historical society. One was about his father's experiences in the Russian Civil War, where he drove a train for the American Expeditionary Forces. The other, *Noah's Barnyard and Other Geological Oddities From This Area*, was adapted from a geology book he wrote for DACC. Another of Davis' interests is building simple radios using galena crystals to detect signals. He wrote an article in a booklet titled *Crystal Set Projects*. Davis also remembers Hilt Johnson fondly. "He was a hardy soul and a great teacher. The geology world lost a wonderful person when he passed away."

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Sixties

Valentine Zadnik, M.S. '58, Ph.D. '60, retired in January 1999 after 25 years as geologist with the U.S. Geological Survey in Washington, D.C.; nine years as geologist with the U.S. Army Research Office at the Pentagon; three years as research geologist at Exxon Laboratories in Houston; and three years as geologist with the A.F. Ballistic Missile Command. He will stay in Arlington, Va., near his 10 grandchildren with frequent visits to his farm outside of Cleveland, Ohio.

Jack Donahue, B.S. '60, is a Professor of Geology and Planetary Science at the University of Pittsburgh with a joint appointment in the Department of Anthropology. He teaches courses and advises graduate students in geoarchaeology and geomorphology. Donahue is married to Jessie G. Donahue and they have two sons, Michael and Jack, who both work with computers. Michael is a Web Master for the Department of Energy Web site.

James (Jim) Bloom, B.S. '60, retired in 1990 after 29 years with Chevron. Now he is "working on the Great American Novel, playing golf and enjoying my grandchildren," he writes. He recently moved to Fallbrook, Calif., which is between San Diego and Los Angeles. "I enjoy receiving and reading the newsletter, but it would be even more enjoyable if there was more alumni news," he adds.

Chris Heath, M.S. '63, Ph.D. '65, worked for Amoco for 26 years, retiring in 1995. His work was both "Geoscientific and also concerned a great many other activities that involved a great deal of travelling all over the world...115 countries at last count. I lived in 12 of them about 20 times in all." Now he is an honorary professor in the Department of Earth and Ocean Sciences at the University of British Columbia in Vancouver, British Columbia. "I look at ways universities and industries employing geologists and geo-

physicists can cooperate and what skills these companies want graduates to possess," he writes. "I have completed a study of the mining industry in Canada and another on the oil industry in the U.K. I am now working on mining engineering and geological engineering. I also have two other projects in the early stages of development." In his spare time he travels a lot and climbs and hikes in the mountains. "Hello to Dan Textoris!"

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Seventies

Owen L. White, Ph.D. '70, has received the Hans Cloos Medal from the Canadian National Group of the International Association for Engineering Geology and the Environment (IAEG). The presentation was made in September at the Eighth International Congress of the association in Vancouver. The Hans Cloos Medal is awarded every four years to an engineering geologist of international standing who has made significant contributions to the art of engineering geology. White is the first Canadian to receive this award. White was the founding chair of the Engineering Geology Division of the Canadian Geotechnical Society and held that position from 1974 until 1979. White, who is now a private consultant, also has been professor at the University of Waterloo and chief of the Engineering and Terrain Geology Section at the Ontario Geological Survey.

W.H. Terry Wright, Ph.D. '70, is a professor of geology at Sonoma State University. He teaches structure, "Shake and Bake" (Earthquakes, Volcanoes and Mountains), leads field classes to the east side of the Sierra and Inyo Mountains and has created educational displays for the geological attractions and wineries. "I visited Alex Maltman Ph.D. '72 in Aberystwyth, Wales, and drove with him to have lunch and tour slate quarries with Dr. Dennis Wood, our Ph.D. thesis advisor

when he was at the U. of Illinois. I have continued exploration of the West by leading an 18-day private-permit river trip through the Grand Canyon and a 12-day private trip down the Tatshenshini River, in Alaska." Check out the news stories and links on the Web: www.sonoma.edu/geology/wright/

E-mail: wrightw@sonoma.edu

H. Richard Naslund, B.S. '72, is professor and chair of the Department of Geological Sciences and Environmental Studies at the State University of New York at Binghamton. His research interests include igneous petrology and ore deposits and he is teaching introductory geology, volcanology, mineralogy and igneous petrology. "I spent the 1995-96 year as a Fulbright Scholar in Chile," he writes. "I participated in Leg 176 of the Ocean Drilling Program which involved two months of drilling into the lower ocean crust on the SW Indian Ridge. I'm currently studying magmatic iron ores at El Lago and Sierra La Bandera in Chile and Kiruna, Sweden.

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Deborah Bliefnick, B.S. '75, is currently a carbonate sedimentologist with BG Technology in Loughborough, England. She was previously a scientist with IKU in Trondheim, Norway.

Jerry Walker, M.S. '75, worked with Texaco after graduation, joined Champlin Petroleum in 1976 and then worked as vice president of exploration for Sterling Oil Company, a small independent firm in Colorado. From there, he went to Sierra Energy in Reno, Nev., and since 1984 has been a private consultant in the petroleum field. Walker is past president of the Nevada Society of Petroleum Geologists. Last August, he met up with George Klein and J. Roger Palomino in Venezuela (see note under "Faculty") when he was working with a French company, CCG, that had a contract with Petroleos de Venezu

Albert V. Carozzi:

The Challenge of Retirement

Since my retirement ten years ago, I have continued my efforts to rehabilitate the work of H.-B. de Saussure (1740-1799), a famous geologist of Geneva. My efforts have included a steady stream of talks and papers in English and French, and the pace of commuting between my office in our department and my other office, in the manuscript room of the Library of the University of Geneva, has accelerated greatly. I have been working on this project for 30 years.

Saussure's reputation in the history of geology is based on his lifelong exploration of the Alps described in his four-volume, *Voyages in the Alps* (published between 1779 and 1796), which inaugurated the geological study of high mountains. In reality, this was only the tip of the iceberg. As the result of unusual circumstances, Saussure's real contribution remained hidden in his numerous unpublished manuscripts kept untouched at the Library of the University of Geneva. That contribution was a fundamental principle of structural geology: large-scale horizontal thrusting in opposite directions as the mechanism of formation of the Alps and of all major mountain ranges. This discovery made him a pioneer of modern tangential tectonics.

After transcribing most of these manuscripts and checking his observations in the field, I was able, two centuries later, to unravel the path of his lifelong rigorous scientific reasoning which led to this discovery. I was joined in my efforts by B. Crettaz, the curator of the Museum of Ethnography of Geneva, together with his team of scientists and historians who were in search of a spectacular way to celebrate the bicentennial of Saussure's death. We prepared a public exhibit, *The Folds of Time, Myth, Science and H.-B. De Saussure*, which illustrates the scientific exploration and understanding of the Alps from the 15th century until today, with Saussure as the main focus. During the next two years, the exhibit will travel to the major cities of France and Italy located around the Alps. Both myself and Crettaz acted as editors of and major contributors to a 350-page commemorative volume of essays in French which develops the major scientific and philosophical themes of the history of geology.

What is next? The treasure of Saussure's manuscripts in Geneva is so rich that it contains numerous documents pertaining to another of his lifelong interests, the famous controversy on the origin of basalt during the 18th century. I am presently correcting the galleys of a 700-page bilingual volume on that subject. The challenge of retirement goes on.



ela, Inc. (PDVSA) for a secondary recovery project.

J. Roger Palomino, M.S. '64 and Ph.D. '76, returned to Peru after graduating from Illinois and then took a position in Venezuela with Lagoven, SA. In 1979 he immigrated to the U.S. and accepted a job with Amoco, where he worked until the mid-1980s. Since then, he has worked with various consulting groups in Venezuela and North America. His current client is KEFAS, a Venezuelan company. Palomino was helping them with a secondary recovery project for Petroleos de Venezuela, Inc. (PDVSA) and met up with Jerry Walker and George Klein in Maracaibo, Venezuela, last August.

Eighties

Karen J. Houck, B.S. '80, formerly at the University of Colorado, Denver, is now an assistant professor at the Department of Geology at Eastern Kentucky University in Richmond, Ky. She is co-author of a recent paper on Pennsylvanian crinoids from the Central Colorado Trough (Minturn and Belton) Formations with Gary Webster of Washington State University. This is the latest published outgrowth of her Ph.D. work at the University of Colorado, Boulder.

Kathleen M. Marsaglia, B.S. '79, M.S. '82, has become senior reservoir geologist/petrologist with Westport Technology Center International (Dresser Industries) in Houston. While at the University of Illinois, Marsaglia was a student of Albert Carozzi.

M. Scott Mansholt, B.S. '82, is an environmental coordinator at Texaco North American Production in Bakersfield, Calif.

Neil Patterson, B.S. '85, M.S. '89 (agronomy, soil science...), is landscape architect with the Forest Preserve District of Cook County. His duties include writing grant propos-

als, planning, design and management for construction and maintenance projects, which include natural areas restoration, bike trails, recreation and picnic areas, bioengineering and facilities maintenance.

Nineties

Kevin Toohill, B.S. '95, has written up his undergraduate thesis for publication which has been accepted by the journal *Physics and Chemistry of Minerals*. The paper is co-authored with Jay Bass and S. Siegesmund of ETH in Switzerland. Toohill has been a staff research scientist at the University of Wyoming for the past year and a half working for the Wyoming Water Resources Center Geographic Information Systems lab.

He successfully defended his thesis and has moved to Montana as a partner in a GIS consulting firm based in Red Lodge (southwest of Billings). "I'm making an early jump into the private sector... to see if I can keep my head above water!" he writes.

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In a note **Stephanie Drain**, B.S. '95, wrote to Department Head Jay Bass she says, "I have been working for the Illinois Department of Transportation for the past year as an Engineering Technician. My job is to design bituminous mixes for the roadways in the Chicago area. I guess you could say that since it involves combining crushed rock

and liquid asphalt which are essentially formed by geologic processes, it can be loosely related to my degree. Well, maybe not, but I thought I'd give it a try!" Drain travels throughout the state to different seminars and conferences. She adds, "It is important for me to say to you and the others in the department, that I learned more from our department than any other in the University. There are a lot of lessons that we learn in college, and although a lot of them come from the classes and the curriculum, the most memorable ones come from the people that we interact with on a daily basis. I honestly feel that geology is a stellar department, with an excellent staff that turns good students into great people."

Steve Sroka, B.A. '80, Ph.D. '96, is director of the Grand River Museum in South Dakota, which will open early this year. The museum, located in Lemmon, S.D., houses dinosaur material that has been collected and was being housed at the University of Illinois. The museum emphasizes the geological, paleontological, and cultural history of the Grand River region. Prior to directing the Grand River Museum, Sroka worked at the Chicago Field Museum and the University of Illinois' Museum of Natural History. The Grand River Museum also will sponsor exploration and excavation digs in the area. Participants come from all over the United States to excavate fossil remains from the Late Cretaceous.

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